ATHLETIC JOURNAL

Vol. XXXIX No. 7

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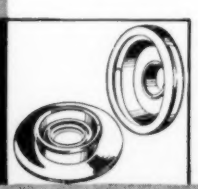

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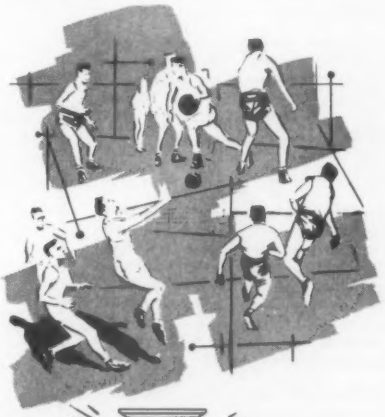

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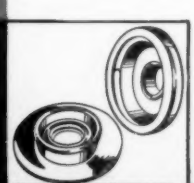

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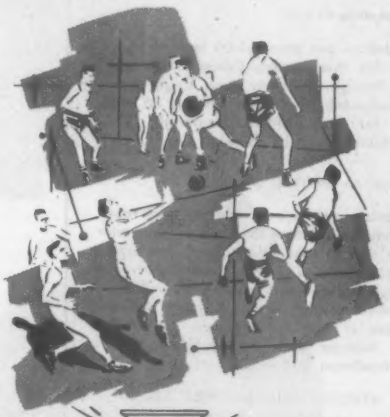

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Volume XXXIX **Number 7**

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2 FOOTBALL ARTICLES

KICKERS ARE DEVELOPED IN THE OFF-SEASON 6
Donald E. Young

DEFENSIVE LINE DRILLS 8
Roger Neilson

2 BASEBALL ARTICLES

A NEW DEVICE FOR DETAILED BASEBALL SCORING 9
Otto E. Ryser

WORKING ON THE HITTER 23
Don Weiskopf

2 TRACK ARTICLES

COACHING THE SPRINT START 12
G. G. Dales

THE DISCUS ANALYZED 36
Don Canham

2 TRAINING ARTICLES

KNEE INJURIES 29
Wesley Knight

SOMETHING NEW IN THE FEEDING OF ATHLETES 68

1 TENNIS ARTICLE

THE SERVE 16
James H. Leighton, Jr.

1 ARTICLE ON ADMINISTRATION

STRIKES AND SPARES IN THE PHYSICAL EDUCATION CLASS 34
Paul C. Shebby

1 GOLF ARTICLE

AN ANALYSIS OF THE GOLF SWING 40
James J. Seri

5 FEATURES

FROM HERE AND THERE 4
FOOTBALL DRILL OF THE MONTH 20
NEW BOOKS 60
NEW ITEMS 68
BUYERS GUIDE 71

FRONT COVER ILLUSTRATION

This issue contains sequence photos of three of the better younger pitchers in the National League. On pages 23 and 32 will be found shots of Larry Jackson and Dick Drott. A sequence of Dave Hillman is shown on the cover.

A Look At This Issue and a Glance Ahead

With spring soon to be "busting out all over," what could be more fitting than a heavy serving of spring sports. The cover article, "Working on the Hitter," not only incorporates 20 excellent sequence pictures, but also describes the pitching strategy of four leading National League hurlers. For that other big spring sport, track and field, we are serving up sequence pictures of two of America's top performers, Al Oerter and Ira Murchison. Speaking of top performers, how about that record-breaking vaulter, Don Bragg? The vaulting styles of both the indoor and outdoor pole vault record holders have been pictorially analyzed in our pages. No other magazine can make that claim. A tennis article and a golf article conclude the spring sports repast. As promised, we are starting to lean, editorially speaking, toward football. This issue finds two football articles plus our feature, "Drill of the Month." A training article and an article on administration conclude this month's bill of fare. Among the features next month will be "The Do's and Don'ts of Pitching" which should prove helpful in explaining pitching technique to younger pitchers. Meanwhile, good luck in the state basketball tournaments.

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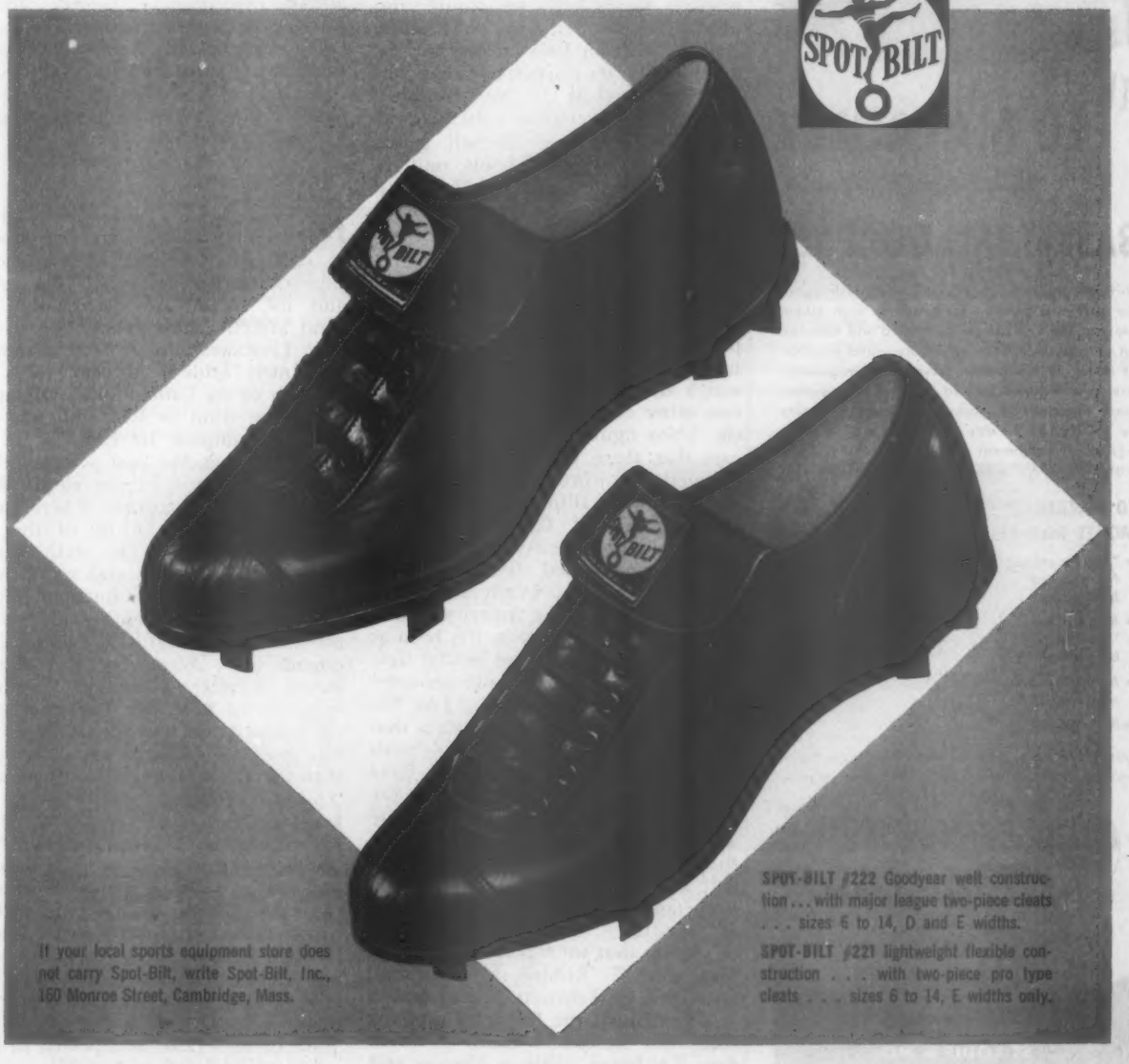

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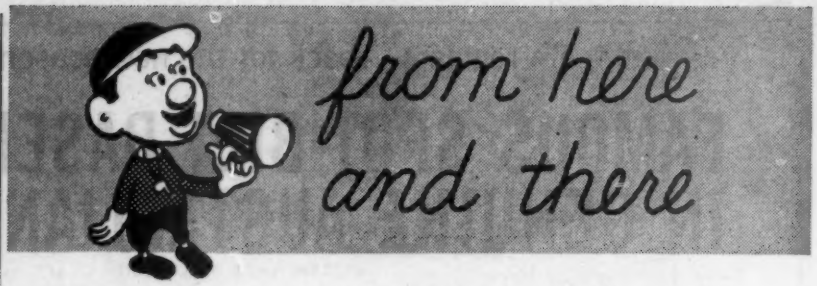

THIS year marks a notable milestone in the histories of two of the leading companies in the athletic picture. Hillerich and Bradsby Co., is celebrating its 75th anniversary, while the Huntington Laboratories are celebrating their 40th anniversary. In wishing them well, we would also like to thank Hillerich & Bradsby and Huntington Laboratories for the 37 and 27 years respectively that they have supported this publication through its advertising columns . . . Out of 355 league football games among Kansas high schools, only 11 ended in ties. Not one of the teams that won the various conference championships was tied, and in only one instance could a play-off of a tie conceivably have changed the way the top two teams finished. It is an interesting fact that of the 21 leagues, the champion did not lose a league game in 15 instances. In two of the leagues, there was a three-way tie for first, and in two other cases there was a two-way tie. These figures would seem to indicate that there would be little need for methods of breaking a tie . . . Just recently two Illinois high schools (Geneva and St. Charles) played a 3-0 basketball game. Wonder how the officials interpreted the "actionless contest" rule? . . . Wally Butts, the new president of the American Football Coaches' Association, has been at Georgia for 20 years, and in that time has seen over 100 of his players enter the coaching profession . . . The National Golf Foundation reports that 56 per cent of the high schools with an enrollment of 100 or more have golf as an interscholastic sport, in the physical education program or in the intramural program. Of these schools that do have golf, almost a third have golf for boys in the physical education classes, while only 9 per cent offer it for girls . . . It is with a great deal of sadness that we report the death of Mrs. John T. Riddell. Mrs. Riddell, who died on February 6, had served as president of the Riddell Company since her husband's death in 1945. Sam Ketchman, athletic director and football coach at Ferris Institute, Big Rapids, Michigan, has made arrangements with the State Department to collect books and magazines on physical education and athletics for the Thailand government. Ketchman reports that this little country is very *athletic conscious* . . . George Monagan, whose article "A Stacked Deck Offense" appeared in the November issue, has organized a basketball clinic to be held in Rochester, New York on April 4. Forddy Anderson will be the featured instructor.

* * *

MICHIGAN STATE has undertaken a rather extensive study to determine whether there is any justification for the belief that milk and ice cream are detrimental to good athletic achievement . . . Gordon Chalmers, Iowa State's newly appointed athletic director, was a member of the United States Olympic swimming team in 1932 and was an NCAA champion in 1933 . . . In Dallas, during the past season, 3000 boys participated in the elementary school football program. There were 103 teams fielded by 68 of the 96 elementary schools. On sixth grade teams, no back may weigh more than 90 pounds, and no lineman more than 115. For the seventh grade teams, the maximum weight for backs is 105 pounds . . . According to a recent survey, a college education is valued in excess of $100,000. The same survey pointed out that the average college graduate earns 88 per cent more than the average high school graduate. This is something for all coaches to keep in mind when counseling their players about the future . . . Walt McPherson, San Jose's popular basketball coach, is a busy man, athletically speaking. During the fall and spring he officiates and umpires football and baseball games, coaches the golf team, and keeps in active trim by competing at the state level in badminton tournaments . . . Quote of the month by John Chamberlain as reported in the

(Concluded on page 59)

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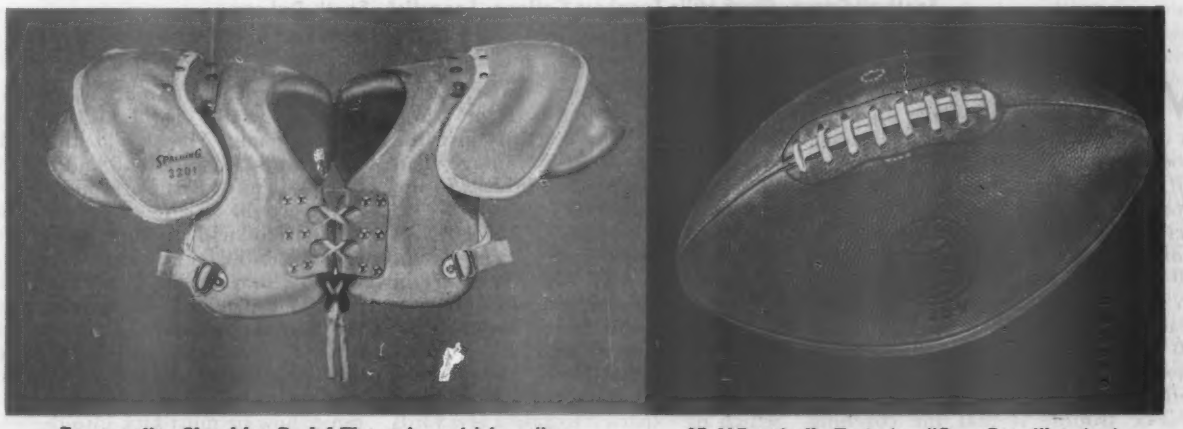

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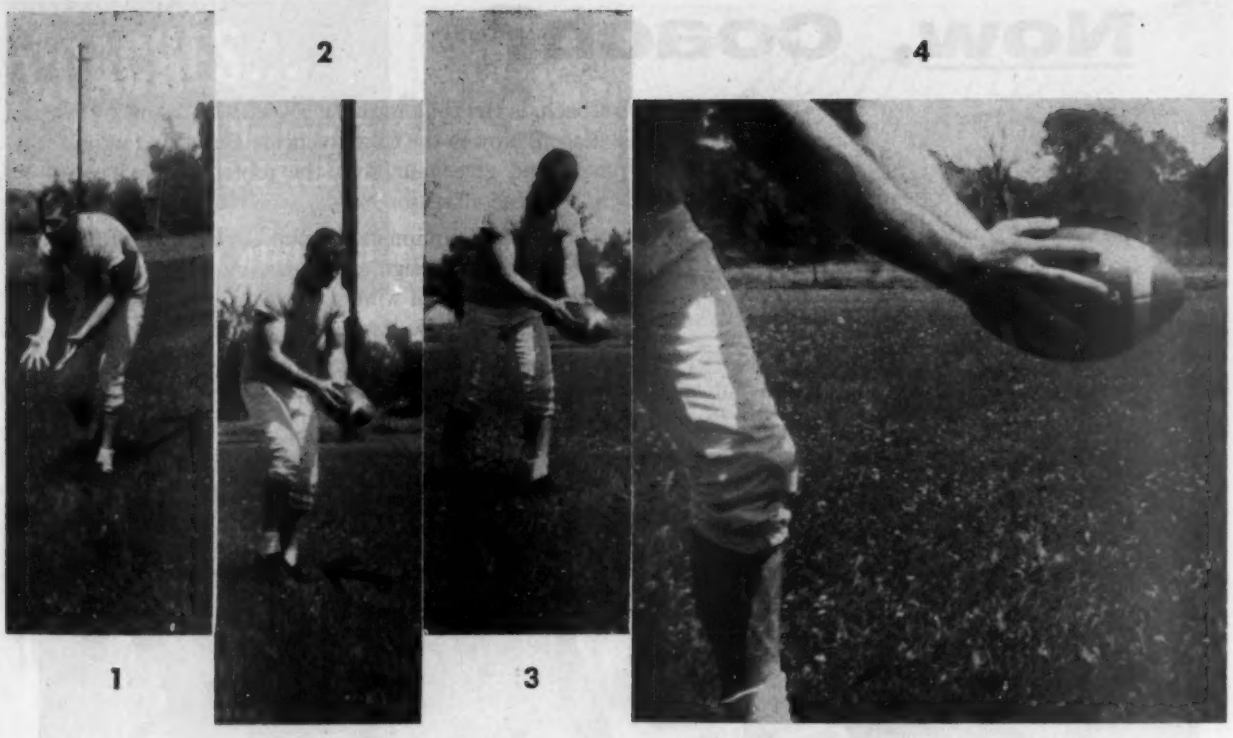


Kickers Are Developed in the Off-Season

By DONALD E. YOUNG
Football Coach, Black Hills Teachers College, Spearfish, South Dakota

VERY seldom is there a football coach, who, upon seeing his punter drop back to kick in a crucial game, does not utter such phrases as *get it off, I hope they don't run it back all the way* or *I wish he'd get lucky and get off a kick that will put them in a hole.* Then, as he watches a towering 60-yard boot, which sends announcers in search of new adjectives, and cheerleaders leaping, sees it come to earth 10 yards beyond the end zone, and says to himself, *Next week I'll work with that kid.*

The trouble is that the coaching staff cannot afford more than a little time to help the individual with his kicking. In addition, punters are not developed in the fall of the year; they are developed in pre-season, or in off-season practice sessions.

Present-day rules help the kicking game to a degree. The ball is brought inbounds far enough to make out-of-bounds kicking easier. Waterproofed leather balls, rubber balls or a dry ball for every play certainly give the kicker of today more advantage than he had years ago when he had to use a water-logged ball.

The coach may say, *If the boy can put his foot to the leather, why should I change his style?* There is a certain amount of wisdom in this observation, but it still bears some of the ingredients of wishing for a lucky kick at a crucial time. The practice of spending hours perfecting plays which are expected to gain a few yards seems to be inconsistent when the opportunity to kick an opponent into a hole, by accurate placement in sideline kicking, or by use of the quick kick, is left to chance.

During the off-season of the year the coach should spend some time with the players who want to make a real contribution to the team by becoming dependable punters, and give them a few tips on the kicking phase of the game. He should then give each candidate a football and tell him to kick it until it is worn out.

We would like to offer some suggestions to help develop better kickers. It should be borne in mind that it is the player himself who must become a student of the kicking game. He must know himself and his limitations under all circumstances. He must learn how to kick on a normal day under varying conditions of fatigue; how he must kick into the wind and with the wind, or when the wind is from either side; how he must kick under adverse weather conditions — rain and snow; and how he must react to pressure. He must learn, through many hours of practice, that he has a particular stance which will permit him to utilize his ability. Football players are not alike in all physical

respects. Some have long torsos, long legs, and short arms, and others have short torsos, short legs, and long arms. They are hinged in different places, and each must assume a somewhat different stance when he is preparing to kick, and when adjusting to the act of kicking.

There are a number of accepted techniques to employ in kicking a ball. Those recommended in this article are called rocker step techniques. The following hints may serve to guide the coach in developing an accurate kicker from a player who has only ordinary talent.

First: Instruct the player that the ball must always be kicked in a straight line. He should never attempt to hook the ball, that is, kick a curve.

Second: The basic stance for a right-footed kicker is shown in Illustration 1. He should relax, keep his eyes on the center, and know where he is going to kick. A kicker should be aware of the kicking situation. Most of his weight should be placed on his left foot; he should bend at the waist; and bend his elbows so that the palms of his hands are facing up. His right foot is back slightly, touching the ground for balance. We believe this stance also helps the center. When a center is looking at a kicker, he sees a target of cradled forearms and relaxed hands rather than a group of outstretched fingers.

While we are on the subject of ball delivery, the advantage of an end-over-end pass from the center merits some consideration. The ball should be placed so that the strings are to the right, at 3:00 o'clock when viewed from the kicker's position, and the ball should be centered end-over-end. The kicker receives the ball in the same position, strings on the right, and does not have to adjust it to get the strings on top.

Third: As the ball is received from the center, the kicker rocks back on his right foot. He should not step back with his right foot, but use it as a rocker on a rocking chair, thus shifting his center of gravity from forward to back. It is helpful to use a count system, and the count of one should begin as the left foot is planted in the movement to the rear (Illustration 2).

If necessary, the kicker can take a quick glance toward his kicking target. The target will be either sideline, the safety man or a spot on the field. The entire sequence should be one of continuous movement, without a pause. At this point the kicker's right foot is off the ground, and all of his weight is on his left foot. This is very important for proper kicking balance and technique in the rocker step. At this stage, if the kicker assumes a stance with his left foot back and his right foot ahead, he is way off kicking balance. A slightly elevated right foot is called the pointer foot.

Fourth: The kicker should step forward with his right foot in the direction the ball is to be kicked. For example, if the ball is to be kicked to the left, then this step is taken in that direction. It may only be a short, dig step, under the kicker's center of gravity, and it is executed on the count of two (Illustration 3).

Fifth: Now the kicker should step forward with his left foot in the direction of the kick (Illustration 4). This is count three. Then he should drop the ball and kick in a straight line.

Actually, the kicker can practically stand in place and go through the three counts — kick, and advance only a short distance toward the line of scrimmage. An important factor which should not be overlooked in this rocker step kick, is the rhythm of steps which contribute to a coordinated kick, as compared to the one step and kick technique.

When he is kicking the ball, the kicker's foot should be extended in a natural position, as if he were reaching out to tap an object with his toe. He will probably do a better job if he wears low-cut shoes, because they permit maximum extension and depression of the foot. If the kicker wears high-cuts, or tapes his ankle, thus placing his foot in maximum elevated position, he must practice kicking in those shoes, and he should try to wrap his ankle in order to permit his foot to move from the elevated to the depressed angle. An attempt to kick a ball when the foot is elevated in near maximum position will result in an end-over-end kick which will be almost straight up.

Many techniques have been evolved for holding the ball and dropping it. The most important factor to be considered is that the ball should be dropped flat, so that its long axis is parallel to the ground and pointing nearly straight ahead, or just slightly toward the inside. One sound method of holding the ball is to place the hands on either side of it so that the kicker's thumbs touch (Illustration 4).

The height from which the ball is dropped depends on the kicker, and the type of kick he wants to get off. As a rule, it is recommended that the ball be dropped from a position just above knee height. Timing the kick is of utmost importance. A ball is propelled when it comes in contact with the kicker's instep, just as his lower leg is straightened from hip to toe. Obviously, this point of snap can take place a few inches above the ground, at knee height or waist height. When this point of maximum velocity is reached, the dropped ball is contacted.

Very often, the punter, searching for form, is guided by pictures of All-Americans, who are posed with their eyes to the heavens, and their toes above their heads. The accuracy of a kick is not dependent upon the theory that follow-through over the kicker's head is essential. That is why the punter must be developed during pre-season practice. He should kick for specific targets, short and long, 15, 25, 35, and 45 yards so that he will know his capability. Only constant practice will enable a kicker to know just what he has to put into a ball to make it go where he wants it to go.

During the regular season the punters are invariably *pressured* by circumstances. They are trying to impress teammates with their skill, the coaching staff in order to earn a spot on the team, bystanders, fans, and the press by *booming the ball* skyward. Few people appreciate seeing a kicker boot a low spiral out of bounds, and the players know it. Kickers are not developed by kicking a ball a few times each afternoon. Many hours of pre-season practice must be devoted to acquiring the necessary skills.

Many of the basic fundamentals of kicking can be practiced indoors. Center to kicker delivery of the end-over-end pass, or the spiral pass can be practiced. The kicker can practice dropping the ball as he goes through his routine in the rocker step technique. When he is kicking for controlled distance, the punter may practice indoors in a gymnasium. He need not attempt to *kick out the lights* when accuracy of placement is the desired product.

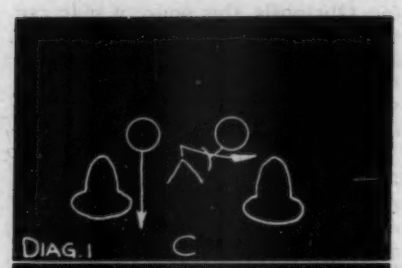
A player who practices kicking, and who does not have a center to deliver the ball to him, should spin or tumble the ball each time he prepares to kick, thus simulating a pass from center. This simulated pass from center should also be made sometime during the practice kicking session in order to represent a bad pass from center — high, low, to the left, and to the right. These so-called bad passes can often be minimized if the kicker is able to adjust to the situation, and during a game is not the time to get this experience. The real danger lies in kicking only under ideal situations and conditions, when there is no pressure, and ideal weather conditions prevail.

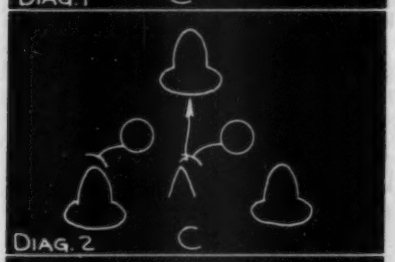
As the pass from center is received or simulated, the kicker should go

(Continued on page 65)

Defensive Line Drills

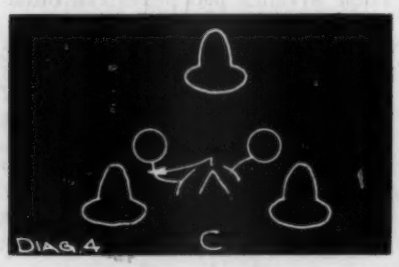
By ROGER NEILSON
Football Coach, Pulaski, New York, Academy and Central School





WHEN we began to use gap defenses, we found that our linemen were being blocked too often by offensive men who had a desirable angle. Therefore, it was necessary to place greater emphasis upon teaching our players to recognize instantly the pressure of any blocker and to react accordingly with the least possible delay. The solution, we decided, must be a series of drills in which no backfield maneuvers assisted the defender in diagnosing the direction of a play, yet he should be able to react in the proper manner to stop the play.

The first drill, shown in Diagram 1, requires two bell dummies placed about eight feet apart. The line between the center of these dummies serves as an imaginary line of scrimmage. Two offensive players were placed on one side with a normal tackle split. One defensive player was placed facing them, and he was instructed to play the gap. A coach was located behind the defender to give the starting signal to the offensive players and to indicate the blocking. One-on-one blocking is used in this first drill.



The offensive player who is serving as the blocker assumes that the path of the ball-carrier runs directly through the dummy on his outside and attempts to block the defender away from the dummy.

The defensive player is instructed to charge the gap, using his hands on one or the other of the offensive players. When he realizes which player is blocking him, he is instructed to fight off the blocker and tackle the dummy. Until the action begins, the defensive player has no way of knowing which offensive player will block him or which dummy he will tackle. Whenever one of the blockers is a center, he is given a ball to snap before blocking to set up a game-like situation as well as to give the defensive player a signal upon which to charge. If neither blocker plays center, a center is placed behind one dummy so the defensive players will develop the habit of charging with the snap of the ball.

When our players become fairly proficient in tackling the correct dummy, a third dummy is set about four yards behind the blockers as shown in Diagram 2. When the coach indicates that one blocker is to use a pass protection type block, the defensive lineman is expected to rush in and tackle the third dummy, which represents a passer. The offensive lineman who is not responsible for blocking is not permitted to cross the line of scrimmage, but is instructed to assume a blocking position on the dummy next to him.

Our next task is to teach our defensive linemen to determine the pressure of a one-on-one block from a head-on position. For this drill the space between the dummies is narrowed to about two yards. One offensive and one defensive man are placed between the dummies (Diagram 3). The blocker is told which way he is to move his opponent, and the defensive man is expected to determine this movement and react accordingly. Throughout this drill the coach occasionally calls for the pass protection type block, thus giving the defender constant practice in rushing the passer.

The next addition is designed to teach the defensive lineman the more difficult task of beating the two-on-one block. The coach indicates to the offensive players which one is to act as the post and which one is the drive man. The defender must determine which way the offense is trying to move him and tackle the correct dummy. Even though both players are now blocking the defender, it has been our experience that the boys soon learn to which side the play is going, provided the blockers do a respectable job. This drill is shown in Diagram 4.

We use the drill which is shown in Diagram 1 with our linebackers in a two-point stance as well as with the linemen. Then we like to combine a lineman and linebacker in the same drill. In order to do so, three offensive linemen are used as shown in Diagram 5. The defensive lineman is positioned head-on the middle offensive lineman, and the linebacker stands behind him or slightly to his left or right. When the coach signals a run to either side, the middle offensive

(Concluded on page 46)

ROGER NEILSON played at East Stroudsburg, Pennsylvania, State Teachers College, graduating in 1953. After serving two years in the army, he spent two years coaching the line at Newark Valley, New York, Central School. He is in his second year as football and track coach at Pulaski, New York.

A New Device for Detailed Baseball Scoring

By OTTO E. RYSER
Gymnastics Coach, Indiana University, Bloomington, Indiana

SPORTS records, generally classified as sports statistics, have played an important part in almost all of the organized sports for many years. This is especially true in the case of the national pastime — baseball. These data have proved to be interesting to the spectators, helpful to the players, and vital to the coaches. An accurate record of what has happened throughout the season is an invaluable aid in helping a coach decide which player to place in a certain position and what he should have that player try to do.

In order that the coach may derive the most benefit from the statistics, it is necessary that the information be complete, detailed, and accurate. The method of recording the actions of the game which is now generally in use is certainly accurate, when handled by a capable person, but it is lacking in completeness and detail. Last season an effort was made by the officers of the Bloomington, Indiana, Babe Ruth League to devise a better method of scoring the game and keeping records.

One of the pressing problems which had beset the group was that of selecting players for an all-star team to represent Bloomington in the state play-offs. Only 15 of the 90 boys who were members of the six teams could be placed on the representative team. Therefore, some means of selecting those most deserving of the honor and responsibility, had to be developed.

Heretofore, the coaches, managers, and other league officials came together and discussed the relative merits of Jones and Smith for second base. There was little objective evidence other than simple batting averages and, in some instances, the number of errors made, to substantiate the claims made for each player. In order to assure that the best player would be selected for each position, much more information about his play during the season was necessary. The group determined to see if this additional information could be gained.

It was decided that the new device, or scoring method, would have to permit speedy recording of the important actions of the game and, if possible, it should be in a form which would permit quick digestion of the vital statistics. In this way, coaches could use the information during the game as well as at the end of the season.

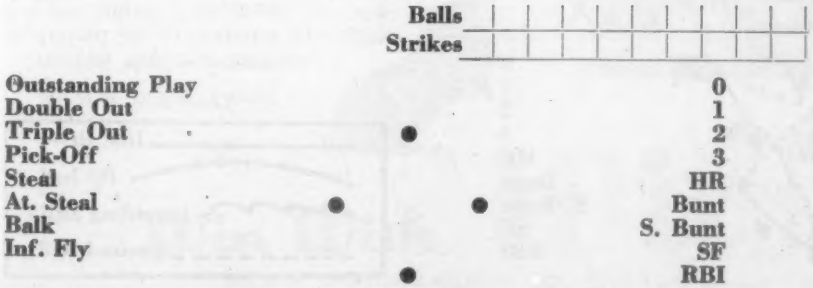
The additional criteria were taken into consideration. It was felt that in order to be practical, the new system should not involve unreasonable expense, and the actual operation of the device should be simple and fairly easy to learn. These two factors were considered important if the system was to be used extensively. Simplicity is especially essential in Little League and Babe Ruth League situations where changing and untrained assistants for scoring and keeping records are frequently the rule rather than the exception.

The next problem was to determine what facts should be recorded. In addition to the data recorded in the standard scorebooks, the following actions were considered worthy of consideration:

1. Number and kind of foul balls hit: a. foul tip; b. over the backstop; c. over the left or right field fence; and d. bounding ball, roller, fly or line drive.
2. If a ball was hit fair, when, how, and where was it hit: a. number of balls and strikes at the time it was hit; b. the exact path of the ball; and c. a line drive, fly, roller or bounder.
3. Were strikes swung at and missed, called or fouls?
4. Did the batter swing at bad balls?
5. Did he swing at good balls or just stand and hope for a walk?
6. Defensive errors (physical): a. misjudged a fly ball; b. let the ball roll between his legs while running to the left, right or forward; c. failed to touch the bag (force play or at first) or pulled his foot off the bag while reaching for the ball; d. a dropped throw; and e. a wild throw.
7. Defensive errors (mental): a. threw to the wrong base; b. failed to cover the bag; c. failed to back up a throw; d. stood and held the ball too long.
8. Offensive errors: a. picked off the bag; b. ran to a base already occupied; c. poor slide; d. watched the ball instead of the coach.
9. Exceptional or outstanding plays: a. stopped a hot grounder; b. caught a fly or line drive after a long run; and c. thought quickly in playing the ball.

Why it is necessary to have all this information? Let us assume that two players have the same number of strike-outs from the same number of times at bat. If a coach knows that one of the players has hit a number of foul balls, some of them good drives that just went foul by inches before striking out, and the other player rarely gets a foul tip, he would be justified in selecting the first player. If two pitchers have identical rec-

Chart 1



ords, but one constantly gets himself into a situation where he has a three and two count on the batter before he manages to get him out, and the other pitcher seldom throws three balls to a batter, the second pitcher should be selected.

By recording the way in which errors are made instead of simply recording the fact that the second baseman made an error, the information can be used as a coaching aid. Often in both Little League and Babe Ruth League play, there is little time to practice, and the weaknesses of the players are not always discovered. If a player frequently makes an error on a certain kind of play as indicated on the scoring chart, that weakness can be worked on.

By studying an opponent's batting habits (where he usually hits, etc.) the defensive players can be stationed in the best position to play that particular batter.

After deciding which facts were the important ones, it was necessary to devise an instrument or chart upon which to record them. We experimented with several ideas and discarded them after trial. Finally, the form shown in Chart 1 was selected as being the most satisfactory. At first we tried including numbers indicating the players' position, but it was felt that including the numbers made the chart too crowded and cluttered. Only the numbers of the players concerned with the action of each play were recorded as the play was diagramed.

Several different ways of handling the chart were tried. First, the forms were typed on 5" x 8" cards. The loose cards proved to be hard to manipulate when the scorer had to go back to indicate a stolen base, pick-off or any other action on a card that had been used several plays before. Then the cards were punched to fit into a loose leaf notebook. This procedure proved to be less cumbersome, but it was still hard for one man to handle. In addition, it took too long for a coach to look back to find out what certain players had done in previous innings.

Next, six of the forms were mimeographed on an 8½" x 11" sheet of paper and these were kept on a clip board. Now, there was much less need for turning and handling by the scorer, and the coach was able to get an overall picture of six complete plays at a glance. However, it frequently happened that more than six men would go to bat in one inning. For this reason it was thought best to place nine of the charts on a page of legal size paper (8½" x 14"), and to have them printed on both sides to take care of innings in which the team batted around. Thus one sheet could take care of all but a very unusual inning. If more than 18 men came to bat, two sheets would be clipped together.

OTTO RYSER graduated from Normal College in Indianapolis, and then coached basketball at Orange Twp. High School during the school year 1940-41. The next year he was appointed an instructor in physical education at Indiana, and in 1948 was made gymnastics coach. He has been active in youth work, and it was in this capacity that he worked out the baseball scoring system which he discusses in this article.

The sheets were kept on a large clip board and could be handled very nicely. At the top of each sheet, places were provided to fill in the name of the team, inning, outs, runs, hits, errors, and men left on base. The outs, runs, hits, and errors were recorded as they occurred by placing a mark in the proper place at the top. The names of the men left on bases were recorded at the end of the inning. As the teams changed places, the names of the new batters were written in on the next sheet.

A set of symbols to facilitate the recording of the actions which took place in games had to be evolved. The following system is suggested, but any scorekeeper can devise his own.

Each pitch was recorded in the upper right-hand corner of each batter's chart. If the first pitch was a ball, high, an *H* was placed in the first space after the word *ball*. If the next pitch was also a ball, it was recorded in the second space. If a called strike was thrown next, a *C* was placed in the *third* space after the word *strike*. An *S* was used if the batter swung and missed, an *F* was used for a foul ball, and an *L, I or O* indicated a low, inside or outside ball. Should the batter swing at and miss a bad pitch, a small *x* was placed under the *S* representing the missed swing. A small question mark was placed under the *C* if a called strike was considered questionable. This question mark was used to guide in the selection of a player who may have been called out unfairly.

The exact path of a batted ball was recorded in red pencil, while that of a thrown ball was diagramed in black. The type of ball hit was indicated by a particular line as shown in Chart 2.

The action of a batter was recorded by a solid line as far as he went on the strength of his own time at bat. His subsequent actions were diagramed by a broken line with appropriate symbols to show how he advanced (stolen base, next batter walked, etc.). As each fielder moved to play a ball, his original position was indicated by his number and a line was drawn from that point to the spot where he fielded the ball. At that spot a circle was drawn and then the throw was diagramed. If it was a bad throw, an *E* was placed on the line designating the throw. If the throw was good but the baseman made an error, an *E* was placed after the baseman's number followed by the code number of the type of error made. The code number is found in the list of actions deemed worthy of consideration.

If an outstanding play was made, a check mark was placed beside the words, *outstanding play*, on the left-hand side of the chart and a square was drawn around the player's number at the spot where the play occurred. The code number for the play was also added. If a double out was made, the numbers of the players in-

(Continued on page 52)

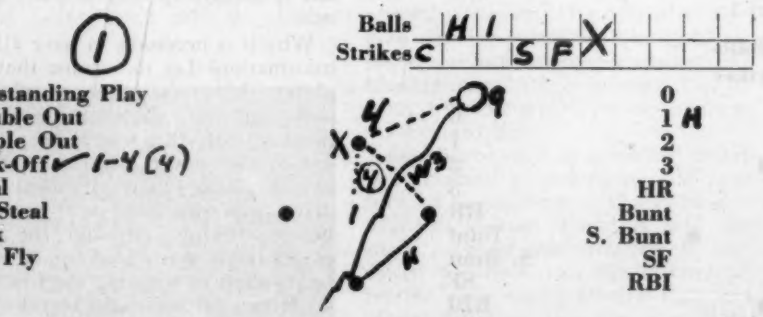
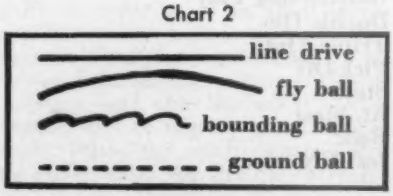


Chart 2



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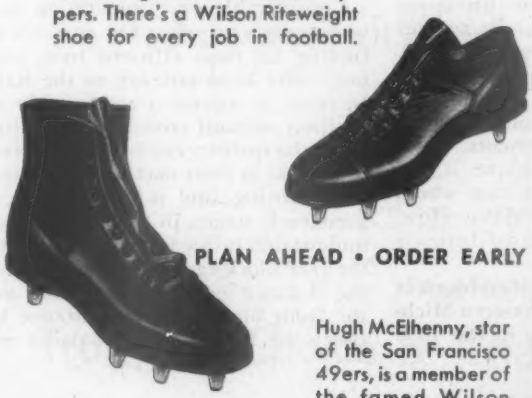

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Coaching the Sprint Start

By G. G. DALES

Track Coach, Western Michigan University, Kalamazoo, Michigan

COACHING the sprint start begins with a realization of the importance of this phase of the sprint race. Time and study must be given to a few preliminary considerations:

1. Good starting technique often decides a sprint race.

2. Individual differences in anatomical structure and body mechanics must be considered in arriving at optimum block setting, hip height, forward lean, and length of the first few strides. Owens, Morrow, Sime, and Murchison all differed in starting techniques to some degree. For an individual to attempt to follow a style which is not suited to him may prove unsuccessful.

3. For the best results complete relaxation, poise, and concentration are most desirable qualities. They must be practiced along with the body movements in taking the marks, geting set, and in exploding off the blocks.

4. Well-coached sprinters do not jump the gun. Coaching the start should include practice in developing confidence, control, and discipline. A sprinter should develop confidence in his ability to move with the sound of the gun, and control and discipline to keep from jumping the gun when it is held two or more seconds as specified in the rules.

5. Once a sprinter gains an advantage of a few inches over his opponents at the start, he needs to run only as fast as the others to win. A sprinter who finds himself in this desirable situation must practice running at top speed and remain relaxed to stay ahead of his opponents.

6. Good starting technique is but one phase of the sprint race which requires coaching and practice. However good the start, it is of little or no advantage unless the pick-up, the body of the race, and the finish are conscientiously coached and practiced.

Illustrations show Ira Murchison as lead-off man for one of Western Michigan's sprint relay teams in the 1958 Drake Relays.

After each of these points is recognized and comprehended, then the actual coaching of the mechanics of the sprint start can begin.

Setting the Starting Blocks

Considerable experimentation may be necessary to assist the sprinter in finding his most efficient foot, arm, body, and head position at the start. In order to assume a comfortable *set* position without crowding or settling back, the sprinter can begin by setting the blocks at their maximum distance. The starting line is not needed in these early stages; in fact, it can be an undesirable influence. The hands and the rear block can be adjusted so that the distance between the hands and the front block, and the distance between the blocks, permit balance and

(Continued on page 62)

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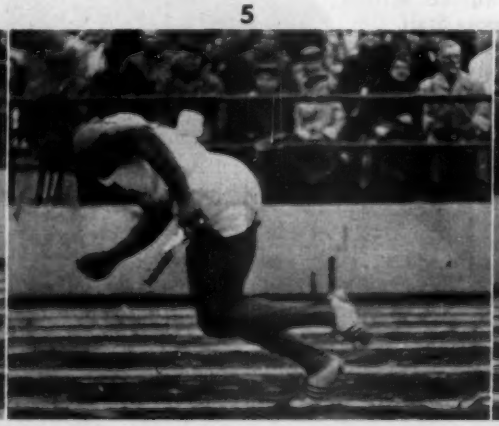

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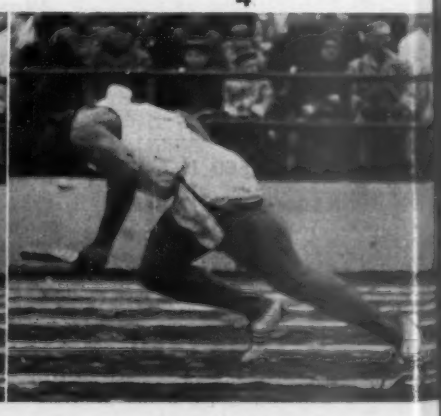

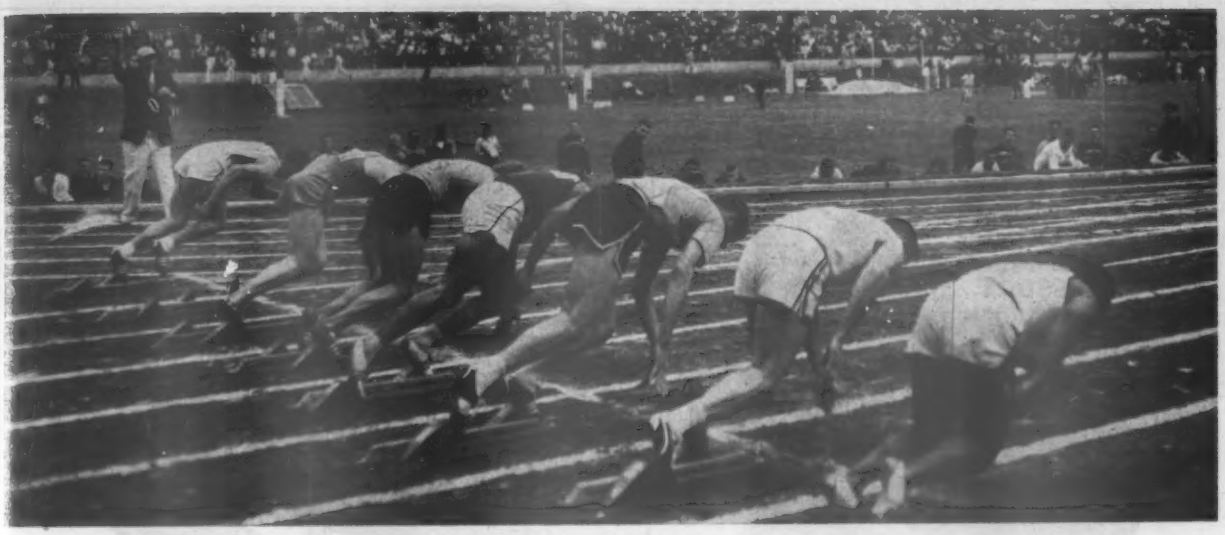

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100-Yd. Dash	9.3	Evanston, Ill.	5/14/55
100-Yd. Dash	9.3	Fresno, Calif.	5/12/56
100-Yd. Dash	9.3	Durham, N. C.	5/ 5/56
100-Yd. Dash	9.3	Texas Relays	4/ 6/57
100-Yd. Dash	9.4	Abilene, Tex.	4/27/57
220-Yd. Dash	20.6	Sanger, Calif.	6/ 9/56
220-Yd. Dash	20.2	Los Angeles	5/ 7/40
440-Yd. Run	46.2	Salt Lake City	6/21/47
440-Yd. Run	46.0	Berkeley, Calif.	6/ 5/48
440-Yd. Run	45.8	Modesto, Calif.	5/26/56
120-Yd. H.H.	13.5	Fresno, Calif.	5/15/56
220-Yd. L.H.	22.2	Durham, N. C.	5/ 5/56
220-Yd. L.H.	22.3	Salt Lake City	6/21/47
400-Meter H.	49.5	Los Angeles	6/29/56
110-Meter H.	13.4	Bakersfield, Calif.	6/22/56
880-Yd. Run	1:46.8	L. A. Relays	5/24/57
2-M Relay	7:22.7	L. A. Relays	5/24/57
880-Relay	1:22.7	Texas Relays	4/ 4/57
440-Relay	39.9	Kansas Relays	4/20/57
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The Serve

By JAMES H. LEIGHTON, Jr.
Tennis Coach, Presbyterian College, Clinton, South Carolina

THE most important weapon in tennis is a good serve, and a good second serve is as necessary as a good first one. At the present time the serve is used as a substitute for ground strokes, but in spite of their contention, the players of today did not invent the serve. Bill Tilden had an excellent one, as did Vines, Stoefen, and Shields. Overstressing the serve has helped to make the present-day game a dull one to watch with its serve and volley, serve and volley. However, the fact remains that the serve is important and should be worked on daily in high school and college coaching.

This article concludes the series on the basic strokes in tennis. For our experts this time we have Don Budge, Helen Jacobs, Lloyd Budge, Bill Tilden, Ellsworth Vines, and Jack Kramer. We are breaking the serve down into the following components: stance, toss, backswing, dip, forward swing, and hit (which includes the follow-through).

Stance

Don Budge — Place the left foot forward a few inches in back of the baseline. The right foot should be from 12 to 18 inches behind the left, depending on the player's height. A player's right heel should form an angle of from 35 to 45 degrees with his left heel. His body should be sideways to the net, and his left shoulder should be pointing toward the court into which he will serve. His weight should be evenly balanced on his toes.

Helen Jacobs — A player's left foot should be two or three inches behind the line and at approximately a 45° angle to the net. His right foot should be about a pace behind the left, and his toes should be on a line almost parallel to the net. A player's body should be sideways to the net, with the shoulders turned in the direction of the serve. The tennis balls and the racket should be just in front of his waist.

Lloyd Budge — The player's legs should be spread apart comfortably. His body position must be patterned after the direction in which the serve is to be made. For the forehand court, his left leg should be slightly to the left side of his back leg. For the backhand court, his left leg should be placed slightly across his right leg. He should rest the racket shaft against his left hand.

Bill Tilden — Serve from a position about four feet to one side of the middle of the court. Place the feet so that the left foot forms about a 45° angle to the baseline. The right foot should be comfortably behind the left, and the player's weight should be evenly divided.

Ellsworth Vines—The racket should be high and rest lightly in the player's left hand. His weight should be on his right foot. Thereafter, until the ball is hit, he should not move his left foot at all, and if his right foot moves, he should just lift it, but not swing it forward except in the American twist.

Jack Kramer — The player's left side should be perpendicular to the net. His left foot should be three to five inches back of the baseline. He should place his feet about one and one-half to two feet apart, allowing his body weight to be distributed equally.

Comments: Stance can vary somewhat, but the player's feet should line up approximately with the intended flight of the ball. Two particular points are worth mentioning here. First, both Helen Jacobs and Bill Tilden mention the player's left foot being at a 45° angle with the net or baseline. Since the server will pivot on the ball of his left foot as he comes in to hit the ball, this angle can make the pivot simpler and smoother. Second, the two Budges and Helen Jacobs both say that the player's body should be sideways to the net. When the stance is taken this way, more shoulder will go into the service. The serve can work out satisfactorily when the player's body is open slightly to the net at the start. However, if any players are having trouble with the serve, particularly if they are falling short of their power potential, the coach should try having them turn more sideways when they are using an open position. We think Vines' statement, *until the ball is hit he should not move his left foot at all*, is questionable as is his, *if his right foot moves, he should just lift it, but not swing it forward*. The left foot should not move forward, but it will pivot before the ball is hit, and the right foot will usually leave the ground on the forward swing.

Toss

Don Budge — As a player settles back with a slight sway to his right foot, he should bring his left hand up with the toss. When he throws the ball up and starts the backswing, his weight should go back to his right foot. The toss of the ball should be synchronized with the swing of the racket. He must throw the ball at correct height in order not to interfere with the completion of the swing. The object is to make impact at the top of the reach of his outstretched arm. Most players throw the ball up above their right shoulders. We advocate tossing it more to the left because the player is forced to sway out slightly after it. This movement assists him in getting his weight behind the ball.

Helen Jacobs — A player should throw the ball up to a height where he will be able to hit it with a fully extended right arm. The ball should then be in a position slightly in front of his left foot so that he can throw his weight into the stroke.

Lloyd Budge — In the toss, extend the left arm as high as possible. The wrist of the left arm should be kept fairly stiff and as straight as comfort allows. Toss the ball as both arms come up. In my own toss, the ball reaches a height of almost two feet above the level of my arm and the racket extension.

Bill Tilden — It is incorrect to hit at a toss; a player should always toss at his swing. By this we mean he should start his swing, and as his racket head is coming up, toss the ball to the spot where the racket will hit it easiest. From a point about shoulder high toss the ball to a point as high as the racket will reach comfortably. The ball should be tossed directly over the player's head. The swing and the toss must be synchronized so they

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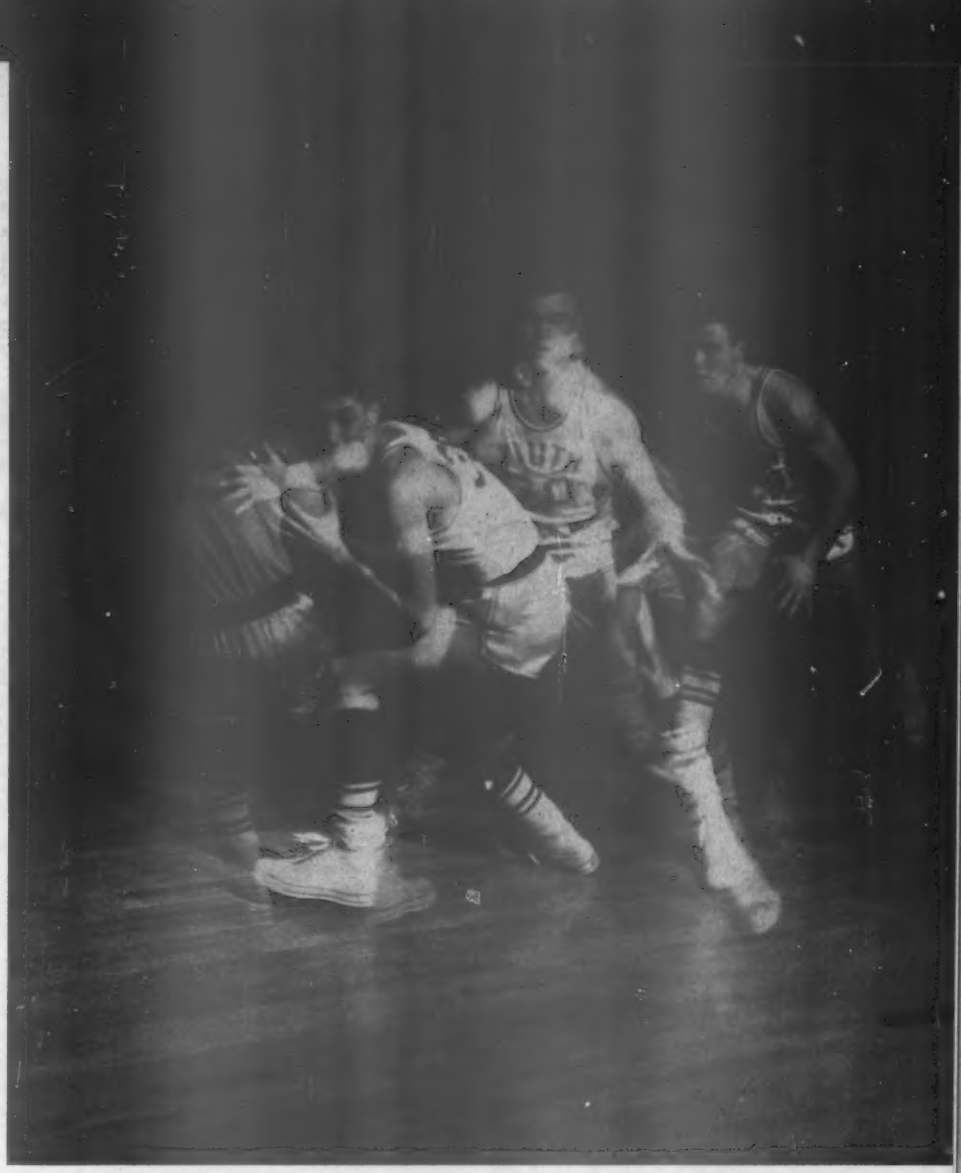

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work together, and the ball and the racket head arrive at the correct spot in the air simultaneously.

Ellsworth Vines — The player's left hand should go up as the racket goes up.

Jack Kramer — When he starts his backswing, a player's left hand should go up to throw the ball. He should throw the ball up so that it reaches its peak at the moment he is going to hit. If his timing is keen, he will be hitting an almost motionless object. As his weight goes forward, the ball is tossed slightly ahead of the baseline.

Comments: Whether or not a player works out the toss in line with his right shoulder (at the point of contact), or his head as Budge mentions, depends on the individual with whom the coach is working. However, the toss should be well out in front and usually over the player's right shoulder.

The height of the ball always presents a problem. It should go up no higher than the point at which it will be contacted. Since the player's left arm should go up all the way, it will be noticed that the ball will be about a foot and a half lower than the center of the racket when both arms are stretched upward at full length. Because there is often confusion in a player's mind just how high the ball should go, the following comments may be of assistance.

There should be no wrist in the toss. It is a push to a certain extent, a placing of the ball to the proper position. The toss is not a throw. It is advisable to check the distance the ball hand comes down during the backswing. In the backswing, if the ball is allowed to go all the way to the player's left hip, more accuracy in the throw and better coordination in the swing may result if lowering of the left hand is held down to about a foot or so. However, it is advisable to let the left hand come down some as the backswing is started.

In order to develop a good serve, the toss must be accurate. Stressing the simplest, most direct way to get the ball up will help. In doing so, the coach should see that his student always keeps his hand in the direct line he is going to toss the ball. Too often the hand strays at the beginning of the toss.

Backswing

Don Budge — Carry the racket back and down at the full length of the right arm.

Helen Jacobs — As a player throws the ball up, he does two things: 1. His right arm drops at the beginning of the swing until it is fully extended behind his right leg. 2. His body weight shifts back to the right foot, and his left knee bends to accommodate this shift.

Lloyd Budge — The racket should be dropped and swung straight back, and the edges should be kept as near parallel to the line of the player's body as possible. Then the racket should swing upward freely to approximately shoulder height. As the racket is swung back, the weight of the player's body should rock back. His right arm should be given a slight head start over his left arm in a pendulum swing.

Bill Tilden — Let the racket swing back slowly to the right of the body.

Ellsworth Vines — On the backswing, the player's body should be turned toward the opponent's court so that when it is turned back into the shot, more speed will be provided.

TWO years ago Jim Leighton, astute tennis coach at Presbyterian College, came to us with a new approach to the discussion of tennis fundamentals. First, he presents the views of a number of recognized authorities, and then sums them up by explaining which methods he prefers and why. At the beginning of the series, he analyzed the forehand and backhand strokes, and followed last year with a discussion of the volley. This article on the serve concludes the series.

His right knee should bend to add power to the stroke. One of the secrets of a good service is a long swing with plenty of arch in the player's back. In the backswing, his left knee should bend outward.

Jack Kramer — A player's weight should shift to his right foot as he starts the backswing. As the racket comes up and over the right side of his body, his weight should be shifted from his right leg to his left.

Comments: We like to stress the fully extended arm at the end of the backswing, and also like to be sure there is no pause at the bottom of the backswing or at the top. The backswing should be free and flowing. One very important point which the experts fail to mention is that the backswing should be slow. There is a great difference between the speed of the racket in the backswing and in the dip and forward swing. The backswing should be made slowly as though a player were measuring the ball with the racket, and it should be synchronized with a slow toss.

The racket should swing up to approximately shoulder height in the backswing as indicated by Lloyd Budge. In most good serves, it will go well above the player's head.

At the end of the backswing, the top and bottom edges of the racket will usually form a perpendicular line with the net. This is not absolutely required, but when working on a new serve there are definite advantages in stressing it.

Dip

Don Budge — In bringing the racket head up overhead in a circling motion continuous from the backswing, the player's weight is transferred to his left foot. The swing continues with increasing momentum as the racket is brought up to describe a partial loop behind the player's head. His forearm should be bent back horizontally.

Helen Jacobs — The racket continues from the end of the backswing in a semi-circular motion to a position behind the player's head. At this point his body has turned well sideways and bent backward to accommodate the motion of the arm. The player's forearm should be horizontal to the ground.

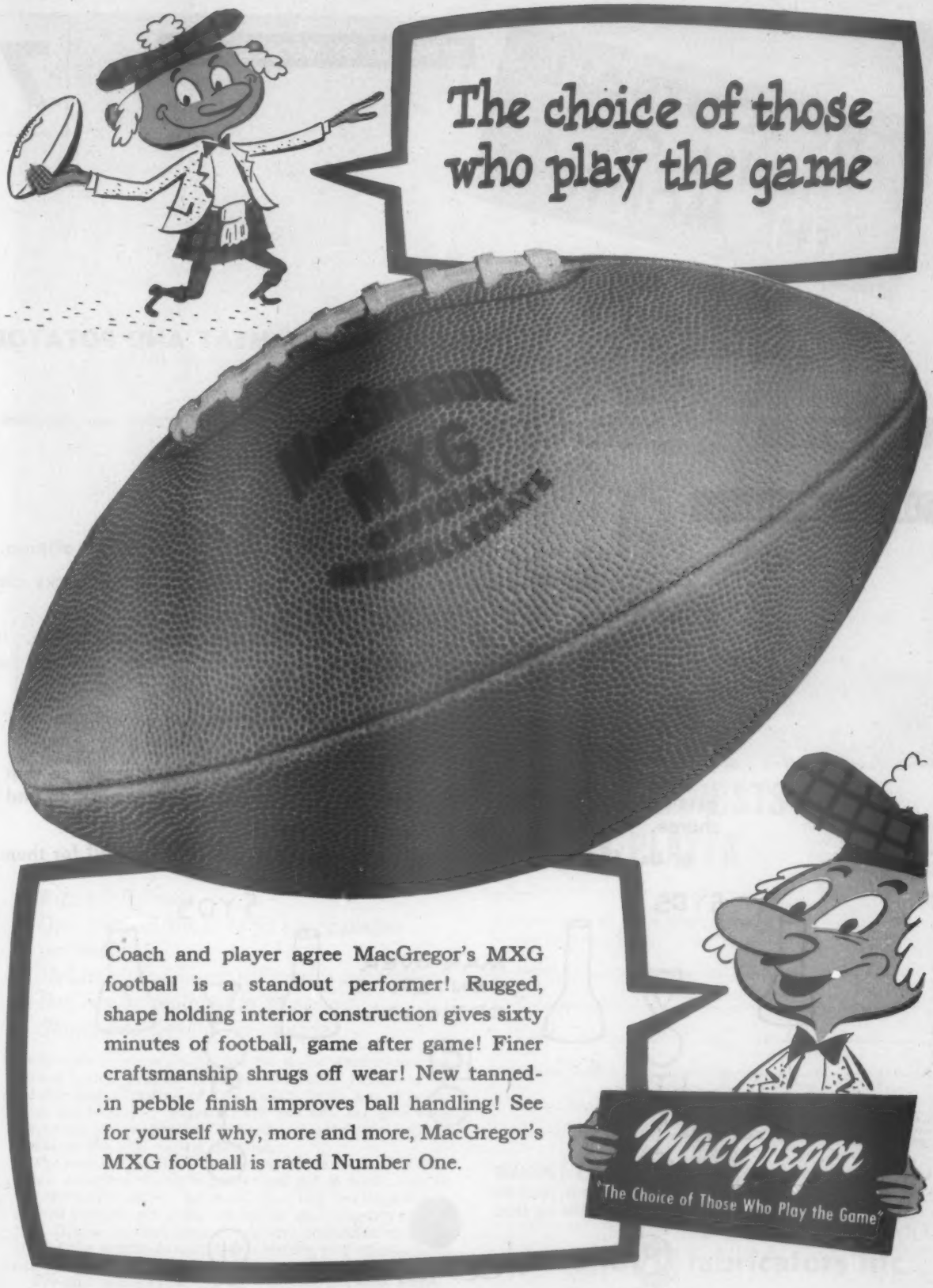
Lloyd Budge — When the racket reaches the peak of the backswing, the player's wrist and elbow are dropped to allow the racket head to fall into a locked position in preparation for the forward swing. Then the racket head should drop below the level of the player's wrist, and the racket handle should dangle loosely in his hand. As his wrist breaks and drops, the racket tends to fall out of line with his body and at an angle somewhat across his body. A beginner should try to keep the angle down as much as possible so that the racket head will be as nearly facing the ball straight-on as can be permitted.

Bill Tilden — The racket swings up to the right of the player's head and above it. A great deal of his weight has now gone back on his right foot.

Ellsworth Vines — The racket drops behind the player's head as his weight transfers into the shot.

Comments: This is probably the hardest point to put across in the serve. We instruct our players that from the end of the backswing the racket should drop downward as though they were going to scratch their backs. At this point, it is advisable not to dip the shoulder too

(Continued on page 56)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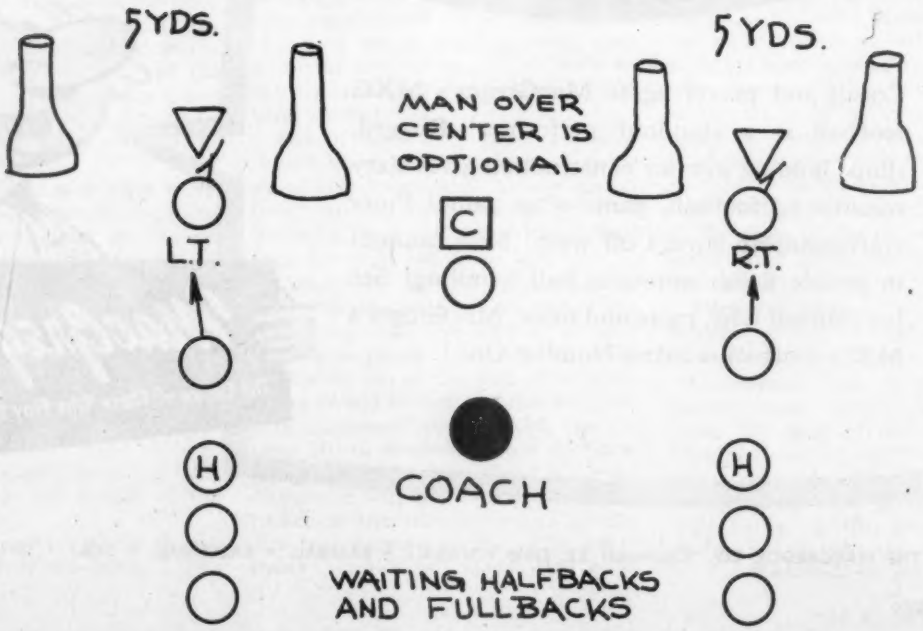

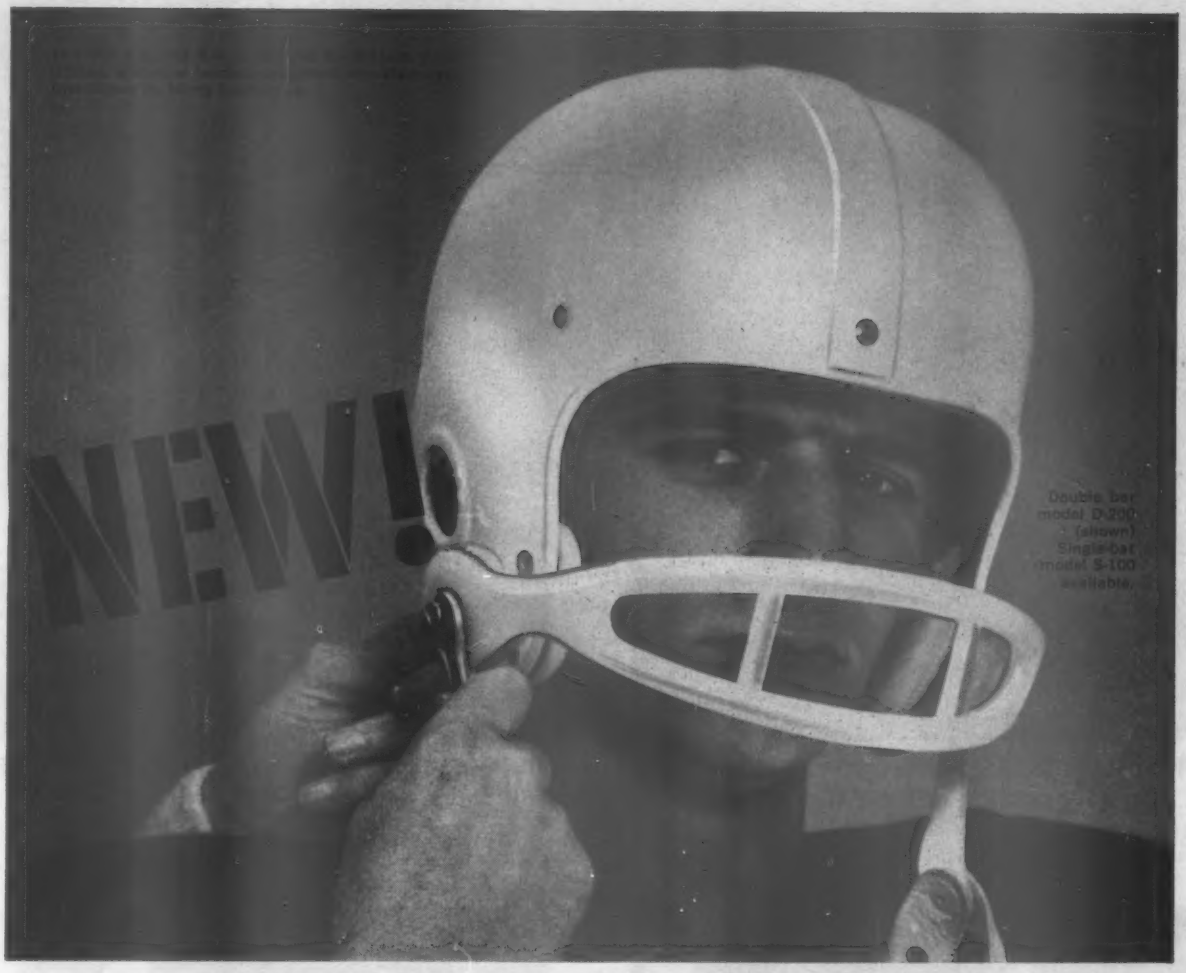

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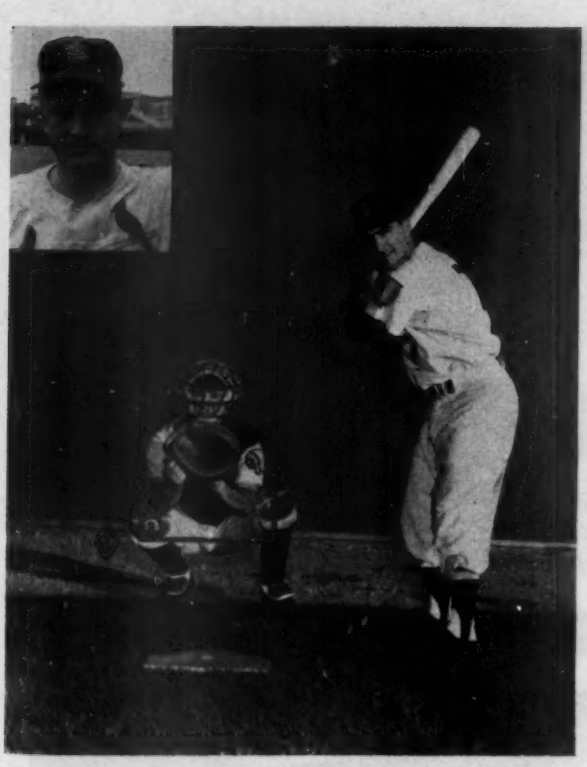

Illustration 1. Larry Jackson (Cardinals), a right-hander pitching to Ernie Banks (Cubs).

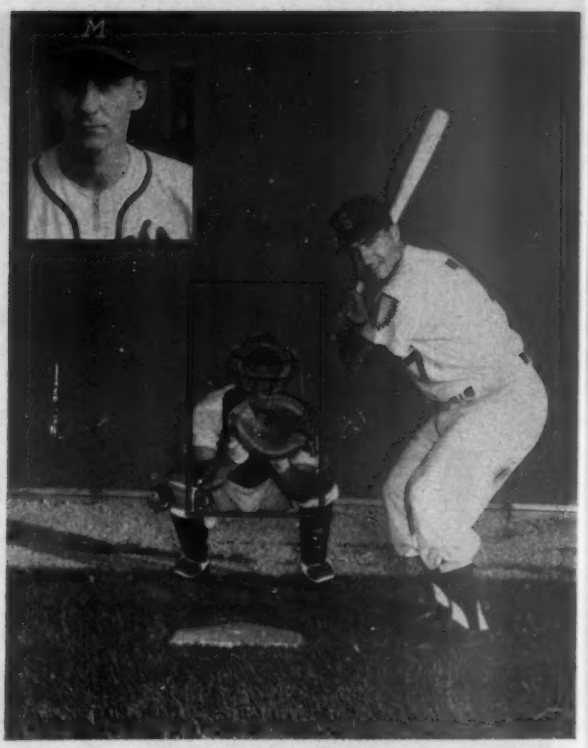

Illustration 2. Warren Spahn (Braves), a left-hander pitching to Stan Lopata (Phillies).

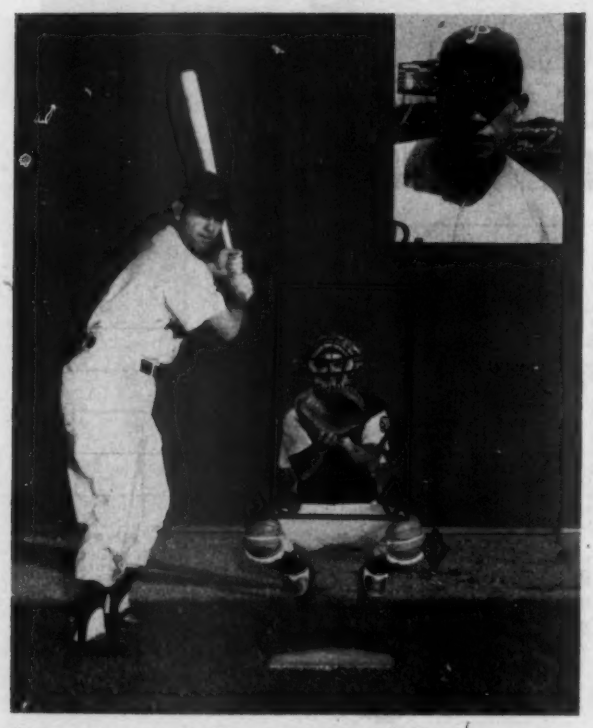

Illustration 3. Robin Roberts (Phillies), a right-hander pitching to Jim Marshall (Cubs).

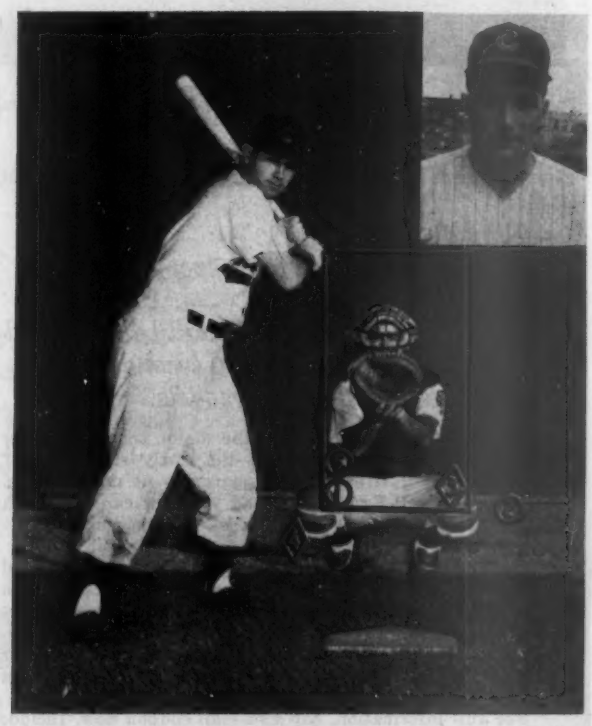

Illustration 4. Moe Drabowsky (Cubs), a right-hander pitching to Ed Bouchee (Phillies).

Working on the Hitter

By DON WEISKOFF
College of Education, University of Idaho

THERE is a big difference between a pitcher and a thrower. Working on the hitter is a quality of a pitcher. The thrower just steps back and throws. On our visit to the Middle West last summer, we had the opportunity to observe some of the top pitchers in baseball, fellows like Warren Spahn of the Milwaukee Braves, Larry Jackson of the St. Louis Cardinals, and Robin Roberts of the Philadelphia Phillies. These men are pitchers out on the mound. They work the ball all around, keep their pitches low, and use a variety of speeds.

We would like to make two points very clear, particularly to the young pitcher. The inexperienced pitcher cannot use the same methods as a veteran such as Roberts. First of all, he simply does not have the pinpoint control to work the corners. Invariably, he will get behind the hitter and *walk himself out of the ball park.* Second, he does not have a variety of pitches which would include the slider, screwball, and others which should come later.

Before we give our principles for working on the hitter, let us explain the four subjects. The four batters are members of the Spokane team, and represent the batting styles and stances of Banks, Lopata, Marshall, and Bouchee. As shown in Illustration 1, Larry Jackson, the Cardinals' right-hander, pitched to Ernie Banks in the same manner as do other National League pitchers. He kept the ball away from Ernie, using a fast ball, curve, and slider. With the count at one and two, Larry came in high and tight on Banks, trying to brush him back. Then, with a two balls and two strikes count, Jackson threw a sharp curve low and outside which Banks hit on the ground for a routine out. Curves thrown slightly off the corner often prove successful against Ernie because he sometimes goes for a bad pitch. Opposing pitchers have found it impossible to throw the ball by Banks. His great wrists and quick reactions are the reason.

Freddy Hutchinson, former manager of the Cardinals, had this to say about Jackson: *Larry has good stuff, and more important, he can get all of his pitches over the plate. His big*

KEY

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SCREWBALL	▽
SLIDER	⌂

LARRY JACKSON (Cardinals)

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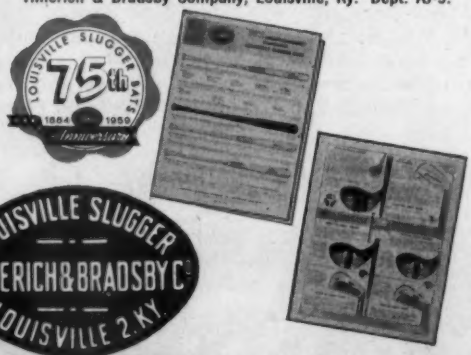

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weakness is the fact that when he gets ahead of the hitter, he sometimes comes in too good.

An excellent example of the way Warren Spahn works on the hitters is shown in Illustration 2. The great left-hander of the Braves has a world of stuff, and he has pinpoint control to go with it. Del Crandall, battery mate of Spahn, whom we consider the finest handler of pitchers in the game, said: *In the early part of Spahn's career, his pitching repertoire consisted of a fast ball, curve, and change-up. His record will prove the success of these three pitches. However, as age began to set in, his fast ball slowed up some, and he went to other pitches such as a slider and a screwball.*

Throwing to Stan Lopata, the Phillies' right-handed batter who uses an unorthodox crouch stance, Spahn, like Jackson, kept the ball low and away from Lopata. After getting the change-up and screwball over the outside corner, he wasted a fast ball outside. With a one and two count, he threw a curve ball into Lopata's fists inside which proved most successful. Even though Spahn kept the ball down on him, Lopata, being a crouch hitter, is a low ball hitter. He wants the pitcher to bring the ball down to him.

Illustration 3 shows the way Robin Roberts works the ball around with his accurate pinpoint control. Roberts, during his long career with the Phillies, has won well over 200 games, and he is certain to make the Hall of Fame. For years Robin has enjoyed great success with his rising fast ball, sharp curve, and remarkable control. Two or three years ago, however, the hitters began to give him trouble, the evidence being a large number of balls hit out of the park. However, last year, Roberts made a strong comeback. He added a screwball and slider to his repertoire, and made it a point to *keep the hitters looser up there.*

DON WEISKOPF competed at Illinois, and then played service baseball in Japan. After release from the service, he signed with Oklahoma City of the Texas League. His baseball career was cut short by a recurring arm injury. He returned to his alma mater, received his master's degree, and in 1956 was appointed to the staff at Idaho. Weiskopf conducts numerous baseball clinics in the Pacific Northwest, and has written several other articles on the game.

As shown in Illustration 3, the Phillies' right-hander really goes to work on Jim Marshall, the left-handed first baseman for the Cubs. After a curve ball stayed outside, he came in with another curve to the outside corner. His slider came in too far, but his fast ball hit the inside corner beautifully. With a two and two count on Marshall, Robin caught the outside corner with a sharp curve. In other words, he stayed out for two pitches, came inside with a screwball and fast ball, and then got his man with a curve to the outside corner. Roberts throws breaking pitches most of the time. He either wastes his fast ball or keeps it on the corners. He throws his slider to the outside corner to a right-handed batter.

Moe Drabowsky, the Cubs' young right-hander, also moves the ball around nicely as shown in Illustration 4. Ed Bouchee, the Phillies' first baseman, bats from the left side and uses an extremely open stance. Moe got ahead of Bouchee by hitting the inside corner with a fast ball. After keeping his second fast ball slightly outside, he hit the outside corner with a sharp curve. With a one and

(Continued on page 32)

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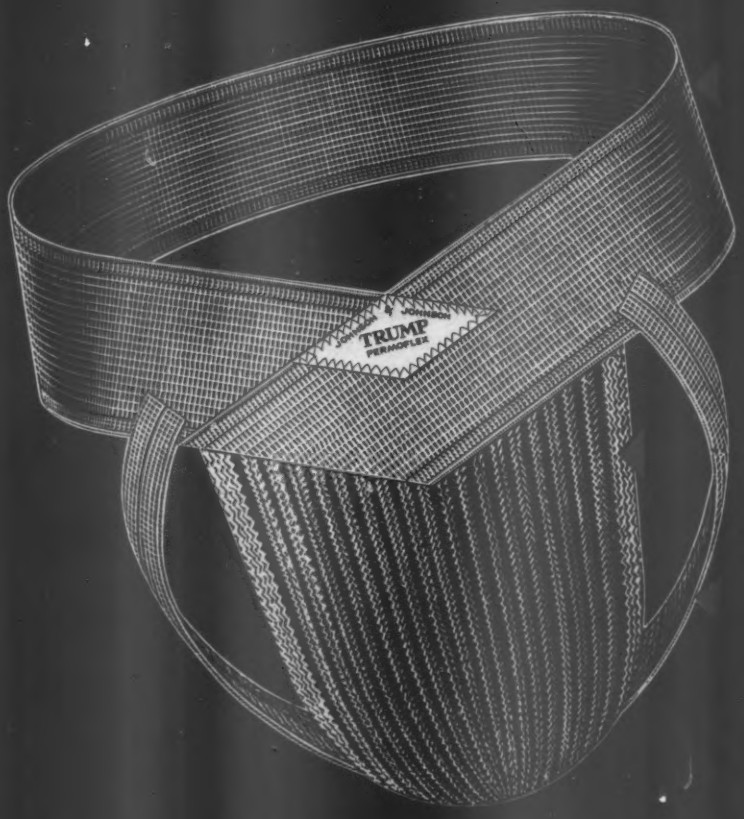

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Knee Injuries

By WESLEY KNIGHT
Athletic Trainer, University of Mississippi, University, Mississippi

INJURY to the knee joint is one of the most common and disabling conditions which occur in athletic competition. Although there are many internal derangements of the knee which may occur, it is safe to say that over 90 per cent of the injuries are located in the internal lateral ligament and internal semilunar cartilage, with more of the latter.

Anatomy of the Knee Joint

The knee is a hinge joint made by the femur articulating on the tibia, with some sliding forward and backward, and a slight rotation around the vertical axis.

Internally, the knee joint construction and action are as follows:

The two semilunar cartilages are elastic. They help lessen shock and jar to the knees, and also steady the movements of the joint. They rest upon the tibia, deepening the surfaces upon which the femur articulates. These cartilages are so-called because their shape and outer borders are thick and convex, and loosely attached to the tibia by the coronary ligament. Their inner borders are concave, thin, and unattached. The transverse ligament is attached to the convex border of the lateral or external cartilage and the concave border of the anterior or internal cartilage.

Of all the internal ligaments, the cruciate ligaments are the most important. They are so-called because they cross each other between condyles of the femur and the tibia. They are called anterior and posterior because of their attachments, front and back on the tibia. The cruciate ligaments contribute to the stability of the knee joint, chiefly by minimizing the posterior movement between the articular surfaces of the tibia and the fibula. They also limit hyper-extension and hyper-flexion of the knee.

The patella, or knee cap protects the joint from blows and weight-bearing stresses. It glides around the anterior surface of the femur and gives leverage to the patellar tendon.

Externally, the knee joint construction and action are:

Laterally, the knee is bounded by the external lateral ligament and the internal lateral ligament. The external, or fibio-collateral ligament is attached to the lateral condyle of the femur and inserts on the head of the fibula. The internal, or tibio collateral ligament is much stronger than the external ligament, not only because of its construction and expanse, but also because of its intimate connection with ligaments and tendons in this area. It is a strong, flat band which extends from the medial epicondyle of the femur to the medial side of the head of the tibia. It is well-defined anteriorly, where it blends with the expansion of the conjoined extensor tendons, but not so well-defined posteriorly where it merges with the oblique popliteus ligament.

The oblique popliteus ligament is situated in the back of the knee.

The patellar ligament is a continuation of the central portion of the quadriceps tendon.

The articular capsule is a loose fibrous investment, completely surrounding the joint, where it is in intimate contact with the collateral ligaments. It is attached to the margins of the tibia and fibula, and the sides of the patella and femur. It is lined with a synovial membrane, with thirteen bursae interposed between tendons, ligaments, and bony prominences.

Sprained Knee Ligaments

History. In examining a knee, the first thing to do is obtain the history of the injury from the patient, in which he describes what, where, and how it happened. Was the injury the result of a blow, fall or twist? Was it a new or a recurrent injury?

Inspection. The second step is an inspection of the part, to observe any abnormality of appearance i.e., a knee locked in flexion suggests a possible meniscus displacement.

Palpation. The third step is palpation. First, palpate the joint capsule anteriorly, then the vastus medialis and lateralis for the presence of muscle contusion, then the medial and lateral collateral ligaments, and, finally, the joint margins of the tibia in the region of the meniscus attachments.

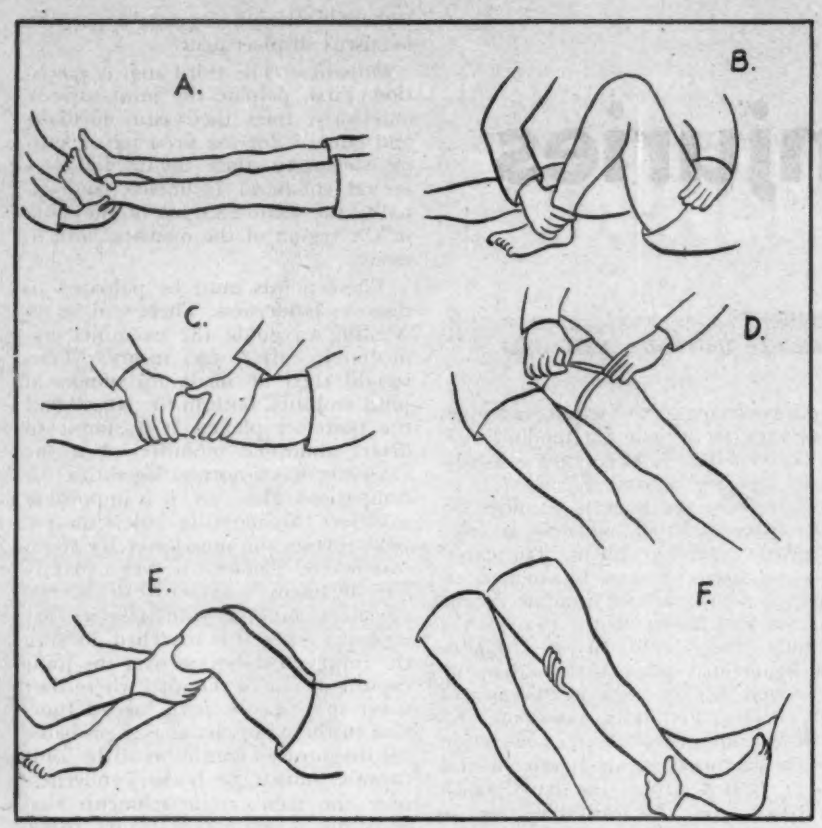
These points must be palpated to discover tenderness. There will be no swelling to guide the examiner immediately after an injury. Tests should then be made for abnormal joint mobility, both in the lateral and the posterior planes. It is simple to detect abnormal mobility when the examiner has a normal leg to use for comparison. However, it is impossible to detect this mobility unless the patient relaxes the muscles of his thigh completely. Tenderness over a plainly seen ligament, together with increased lateral mobility and pain in that ligament when it is stretched, localize the injury. Tenderness over the joint capsule or one of the vasti where they cover the capsule, with loss of function in those muscles, makes probable the diagnosis of contusion of the joint capsule, muscle or both. Tenderness over the meniscus attachments suggests the possibility of injury there. Marked increase in the posterior mobility of the joint suggests a stretching of the cruciate ligaments. The following day a similar examination should be made to verify or magnify the first diagnosis and, together with signs of reaction in the joint, a prognosis may be given. This is the routine examination that should enable an examiner to arrive at a diagnosis in all the important knee injuries.

Internal Lateral - Medial Collateral Tibial Collateral Ligament Sprains

Causal Factors: A football player usually says he was hit on the outside of his leg at the knee joint. His foot was planted on the ground, his knee was slightly bent, and then he heard something snap.

This injury occurs generally from being tackled, or as a result of a low shoulder or body block in football. A similar injury may occur in a pile-up when the extended knee is bridged, without support, between the foot and body of another player. Falling on the knee in this position causes the internal lateral ligament to give away.

A blow from the outside causes the medial condyle of the femur to be raised from its seat as a direct result of the stretching or tearing of the



When an injured knee is being examined, the patient should be supine and completely relaxed. Both the uninjured and injured knees should be examined as follows: A. Inspection and determination of extension. B. Determination of passive flexion. This step follows a comparison of active flexion with the uninjured leg, and is not carried beyond the point of pain. C. Palpation for fluid. Pressure on the suprapatellar pouch drives small quantities of fluid downward. The right index finger is shown about to compress the anterolateral aspect of the joint, producing a fluid wave palpable by the thumbs and left hand. D. Determination of muscle atrophy. The circumference of the thighs is measured at the same level. E. Determination of cruciate ligament laxity. The knee is flexed at a 90° angle. Then the examiner's forearm presses firmly against the lower tibia, while both hands grasp the leg just below the knee and manipulate it in the sagittal plane. F. Determination of collateral ligament laxity. One of the examiner's hands rests on the table and grasps the femoral condyles firmly. The other grasps the ankle and manipulates the extended knee in the coronal plane.

internal ligament. It is obvious that the greater the degree of fixation of the foot, and the greater the amount of flexion of the knee, the greater the stretch in the ligament.

Other factors, such as the type of turf and the playing surface, have something to do with the amount of the stretching of the ligaments. A surface that does not allow the foot to move, but immobilizes it, has a more disastrous effect. The type of cleats also has some effect, because long cleats that do not allow for lateral movement have the same effect as a loose turf, etc. We personally try to stay away from long pointed cleats, feeling that the shorter, blunt, round cleats or oblong cleats do not allow the locking which happens when the longer cleats are used.

Symptoms: There is pain and tenderness over the medial margins of the tibia. Increased lateral mobility is noted in that area when the leg is straightened, or abducted.

Diagnosis: Diagnosis is made upon the recognition of the symptoms. Another examination after a lapse of 18 to 24 hours should always take place for confirmation of earlier findings.

Immediate Treatment: Apply a compression bandage with ¼ inch sponge rubber, and cover the knee with a towel containing ice. This cold treatment should be applied for 30 to 50 minutes. Then the knee should be immobilized and the player should use crutches to keep his weight off the injured leg. An x-ray should be taken to rule out any bone injury. This comprises the immediate treatment. A more thorough and complete day-by-day procedure will be discussed after all of the types of knee injuries are considered because they are all similar.

External Lateral Ligament - Lateral Collateral - Fibular Collateral Ligament Sprain

Causal Factors: The player usually says he was hit on the inside of his leg at the knee joint, his foot was planted on the ground, and the knee was bent slightly.

Symptoms: Pain and tenderness over the lateral margins of the tibia are present. There is increased lateral mobility and pain over that area when the ligament is stretched.

Diagnosis: Diagnosis should be made the following morning, based on history and examination.

Treatment: The immediate treatment is the same as it was for the internal lateral ligament sprain.

Anterior Cruciate Ligament Sprain

Causal Factors: This injury generally occurs when the knee is hyperextended, or it is forced beyond 180 degrees of extension. The blow is generally above the knee, the foot is planted firmly, and the weight of the player's body is carried forward by its own momentum. Complete separation of the anterior cruciate ligament is usually associated with other injuries to the knee, particularly involvement of the collateral ligaments.

Symptoms: The symptoms will be the same as they were for the other sprains.

Diagnosis: Diagnosis should be based on the premise that the player was hit above his knee, forcing the femur backward. The diagnosis is confirmed by a demonstration of abnormal posterior movement of the tibia or on the femur. An x-ray should be taken to check the extent of the injury.

Posterior Cruciate Ligament Sprain

Causal Factors: This injury generally occurs when the knee is hyperextended and the blow is below it.

Symptoms: The symptoms will be the same as they were for the other sprains.

Diagnosis: In this instance the blow was below the knee, forcing the tibia

backward. This is an uncommon injury and is difficult to isolate. However, abnormal backward movement will be present. An x-ray should be taken to check the extent of the injury.

Treatment: Immediate treatment should be the same as it was for the other ligament injuries: ice packs, immobilization, and crutches. If there is a definite tear of the cruciate, an operation is indicated.

Cartilage Injuries

Anatomically, the two semilunar cartilages are considered as ligaments, and should be considered as such in the treatment of knee injuries.

When cartilage gets into the joint and reduces itself, then only a bruising of the cartilage takes place. The cartilage may tear either longitudinally or transversely. The more common type is the bucket-handle, wherein a double longitudinal slit lifts a loose handle-like slit of cartilage. In the latter, the handle has been torn loose, giving rise to two loose ends, either of which might cause locking of the joint. In the case of a transverse or lateral tear loose from its attachments, the cartilage may break into fragments.

Even if the knee has locked, it is almost impossible to say whether or not the cartilage has been injured. The reduction, and the locking itself, are reliable symptoms that the cartilage was edged in between the joint, but most authorities feel that an operation is not indicated as a result of an initial injury.

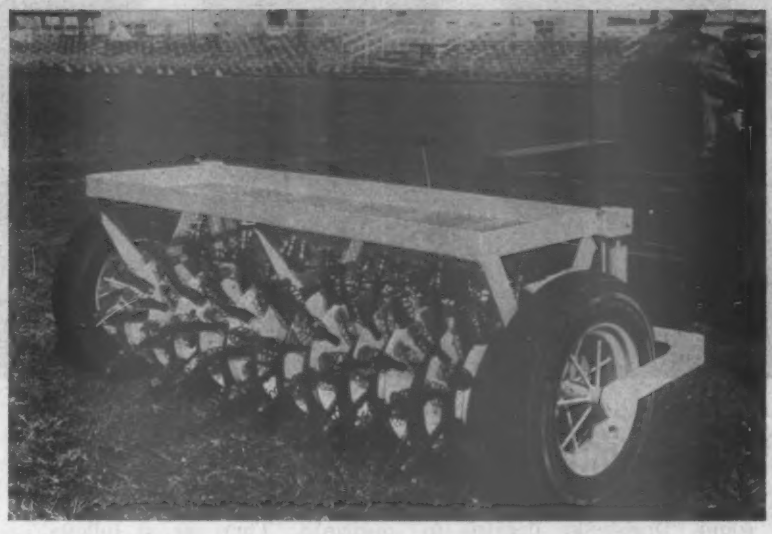
It must be remembered that a reliable overall picture of the knee must be considered — the condition of lateral stability, plus a knowledge of a wedging and the degree of swelling make for a better diagnosis. In any case, this type of injury should be treated by specialists in the field of orthopedics.

Medial Meniscus or Internal Semilunar Cartilage Tear

Primarily, in any cartilage injury, the ligament is injured first. A peculiar twisting or rotating effect takes place between the condyles of the femur and tibia. Thus, when the lateral stability is weakened, the joint opens up and the cartilage may get into the joint opening. This may result in injuries of varying severity to the cartilage.

Causal Factors: The football player says he was hit from the outside of his leg at the knee joint; his foot was

(Continued on page 53)



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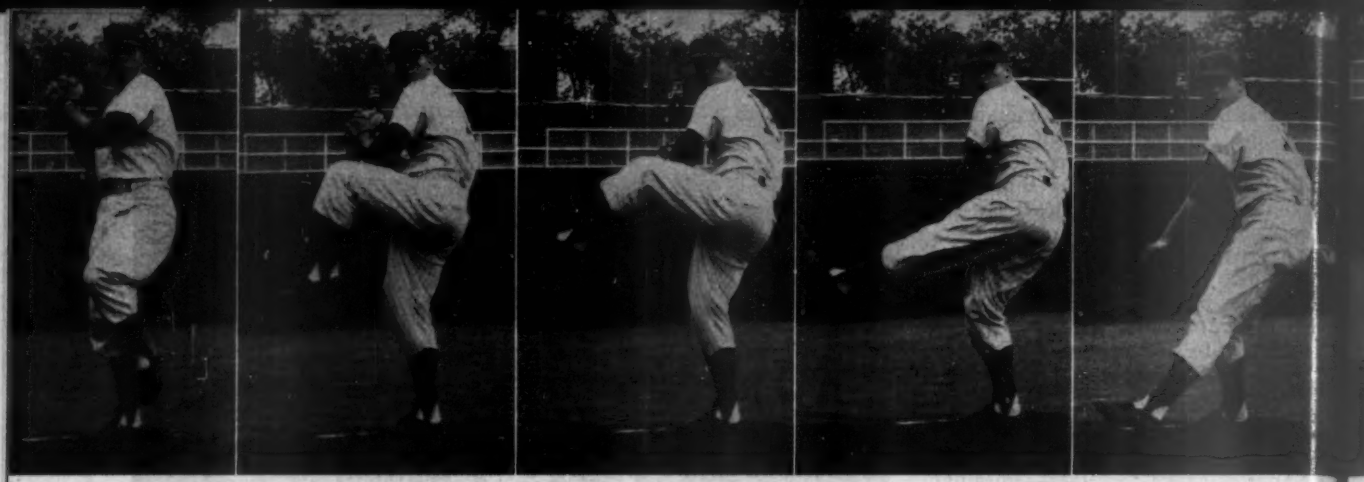

The Hitter

(Continued from page 24)

two count, Drabowsky decided to waste a curve ball low and inside. He threw again to the inside corner, but instead of giving Bouchee a curve, he popped the catcher's mitt with a whistling fast ball to the inside corner. Moe does not have many pitches thus far. He gets into trouble when his fast ball is not right. He keeps his fast ball low and to the outside corner.

Let us consider several principles which would apply to all pitchers, the sand lot players and the major leaguers. The sequences just given are good illustrations supporting these principles. They are as follows:

1. *The pitcher should keep his pitches down, low, and around the knees.* He should tend to work away from the hitter. As Del Crandall commented to us: *If a pitcher could hit the low and outside corner on each pitch, he would be a 20 game winner.* Very few hitters can pull an outside pitch, only exceptionally strong men such as Bill Skowron and Mickey Mantle of the New York Yankees are able to do so. Keeping the ball down is especially important in double play situations. There are four pitching targets, the catcher's knees and his shoulders. For a low outside pitch, the pitcher should throw for the right knee of the catcher; for a high inside pitch, he should aim for the left shoulder, etc. He must keep his eye on one of these targets during his entire motion.

2. *The pitcher should try to get ahead of the hitter, and then he can go to work on him.* This means he has

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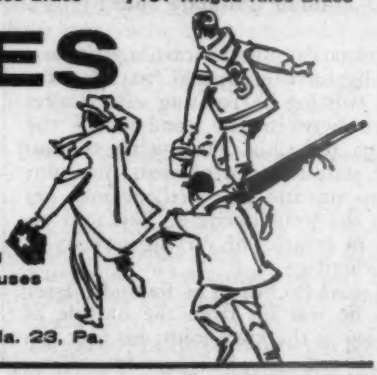

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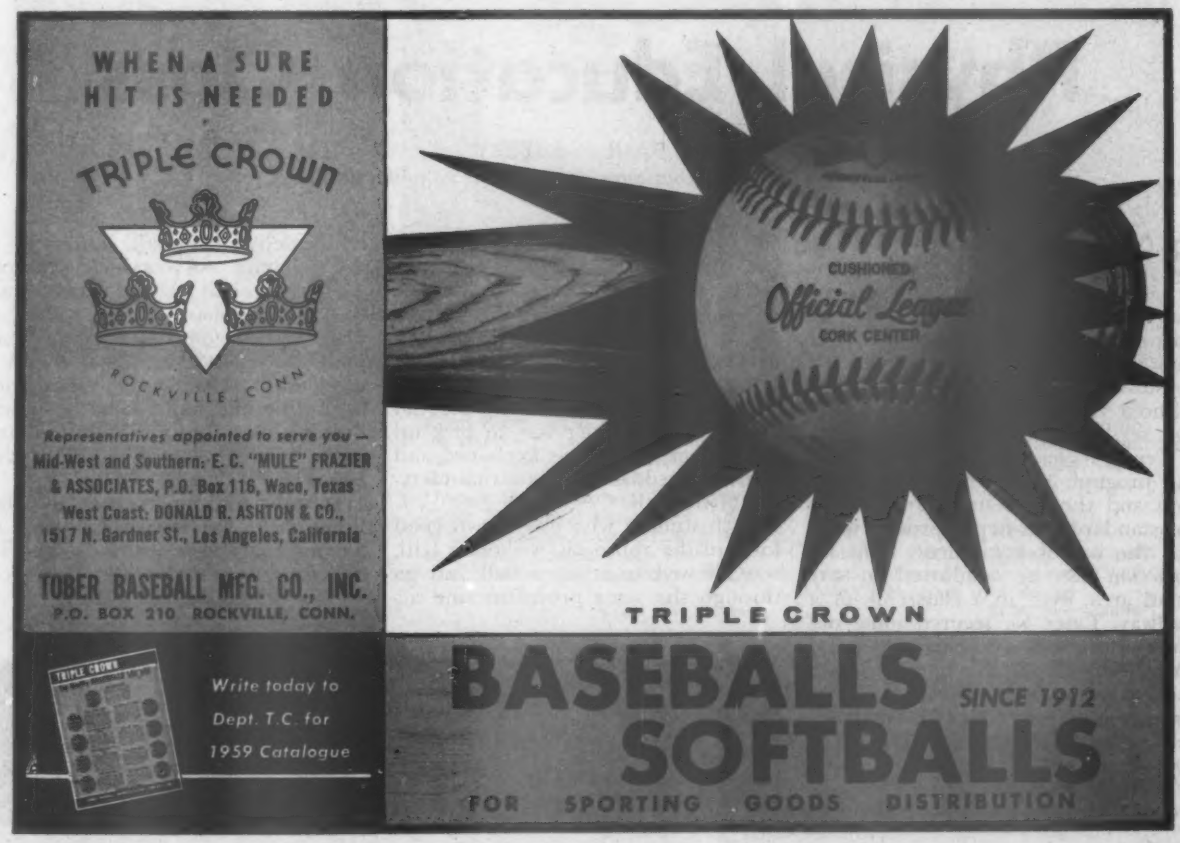
DICK DROTT (Cubs)

to get the first pitch over the plate with something on it. He should not groove it, but he should try to hit the strike zone. When the pitcher is in front of the batter, he can go for the corners, and even stay off the corner a little. The hitter who gets in the hole is apt to go fishing for a bad ball. The good batter knows the strike zone and does not get himself into trouble by swinging at bad balls. This is the player who is the hardest to strike out. When the pitcher has two strikes and no balls on the batter, he should waste one. He should not make it too good. Cal Neeman, the Cubs' capable receiver, commented: *If one pitch is working and the other is not — just show him the one that is not, make him hit the other.*

How does the pitcher work on the corners? He should be ahead of the hitter, and a variety of pitches and speeds are necessary. The right-handed pitcher may throw a curve that goes low and a little inside to a left-handed swinger. His next pitch could be a fast ball in the same area which hits the corner. Or, a right-hander may throw a fast ball, which misses the outside corner, to a left-handed hitter. His next pitch could be a curve which catches the corner. If the count goes to two and two or three and two, he should not be too careful about hitting the corner.

3. *The pitcher should move the ball around, keeping the batter off balance.* He may pitch away from the hitter, getting him while he is leaning toward the plate, and then he comes

(Continuel on page 55)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Strikes and Spares in the Physical Education Class

By PAUL C. SHEBBY
Athletic Director, Schlarman High School, Danville, Illinois

BOWLING became an important part of the physical education program at Schlarman High School for two reasons: 1. lack of facilities, particularly a gymnasium; and 2. need for an activity in which students could compete, on an equal basis, without regard to size, shape, speed, age, sex or physical handicaps.

Ten years ago we started our bowling program by teaching body position and the arm and leg action of the standard four-step approach, without the use of equipment. This instruction can be conducted in any small area, even in a classroom or a hallway. Later we secured some old balls, used pins, a scoring table, and score sheets from the operator of a local bowling alley, at no cost, and incorporated the following methods and procedures into teaching this fine sport.

Selection of a ball, on the basis of weight, size, and spacing of the finger holes, was explained and each student was given an opportunity to select and grip a ball. The students were shown how exact hole measurements are determined, by having a salesman from a local sporting goods store bring up a ball, used for this purpose, and measure some of our potential bowlers. The proper way to pick up a ball from a rack was explained and demonstrated, as was the actual carrying of the ball.

Each student who had shown good form in the approach, without a ball, was allowed to select a ball and go through the same procedure and actually deliver the ball. This part of the teaching was conducted on our practice football field. It is important, during this phase of instruction, to place special emphasis on good body position, smoothness of delivery, a good follow-through, and elimination of lofting the ball. After a student demonstrates ability to deliver a ball, with some degree of accuracy and form, he is ready to bowl.

In order to provide a bowling alley atmosphere, five lanes were set up on a hard court area which is used for outdoor basketball. Circular dots,

(Concluded on page 70)

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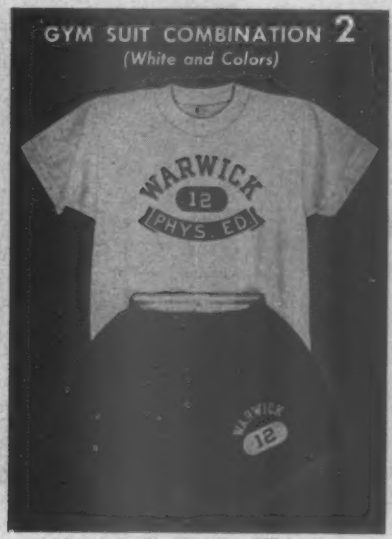

T-Shirt: Style 78QS. White.

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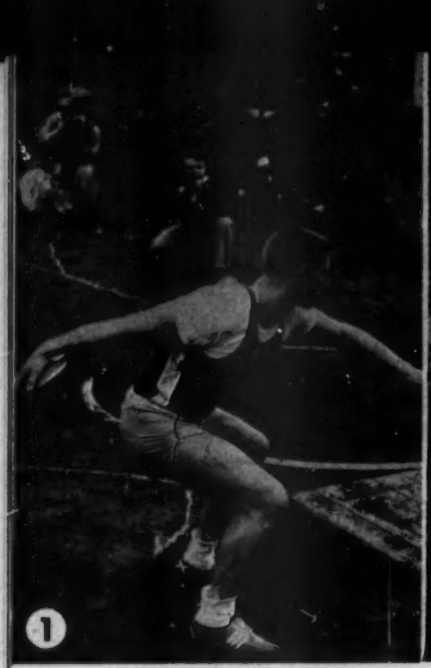


AL OERTER

The Discus Analyzed

(Part Two)

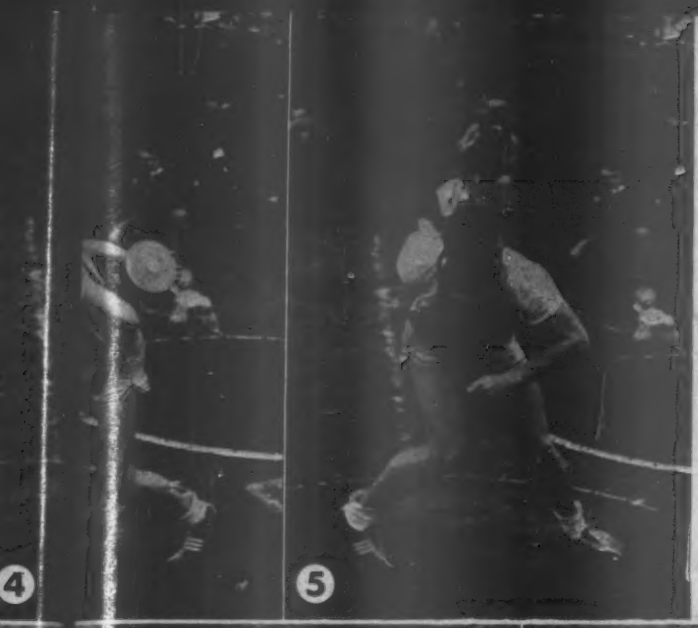
By DON CANHAM
Track Coach, University of Michigan

Last month Mr. Canham described the technique used in throwing the discus. In this article, he discusses the orthodox and the Minnesota style, and concludes with some of his views on competition and training.

When an athlete is learning to throw the discus by using the orthodox 1¾ turn style, he must be cautioned against thinking and acting in stages. While learning may be accomplished piece by piece, all effort and thinking must eventually be concentrated upon a complete, continuous action from the preliminary swing to discus delivery.

Some coaches feel that teaching form in discus throwing can be achieved by using the same momentum, speed, and rhythm that the athlete will employ when he has mastered the technique. We believe learning discus form must be done slowly and the speed increased only in proportion to the athlete's ability to get into the power position at the end of the turn.

In the orthodox 1¾ turn style, the thrower starts by facing to the rear of the circle with his feet about 18 inches apart and straddling the circle diameter line. The actual placement of his left foot from the rear of the circle varies considerably, but most throwers keep their toes between four and eight inches back from the inner edge of the circle. As the swing begins, the athlete determines the plane the discus will travel in during the turn, and to a great extent the rhythm and speed of the turn itself, according to plane and rhythm of the swing. The number of preliminary swings is an individual

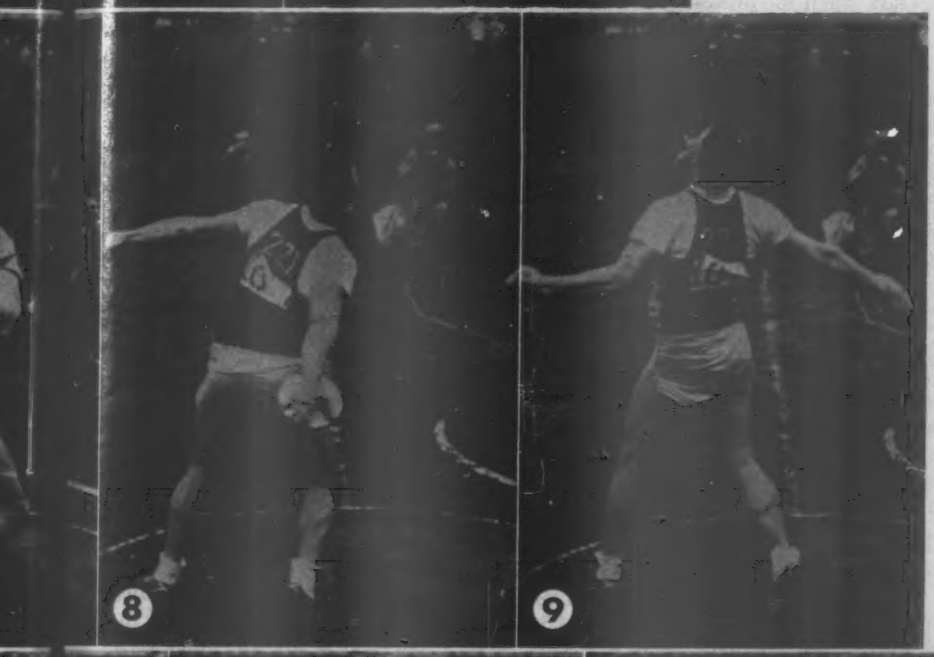


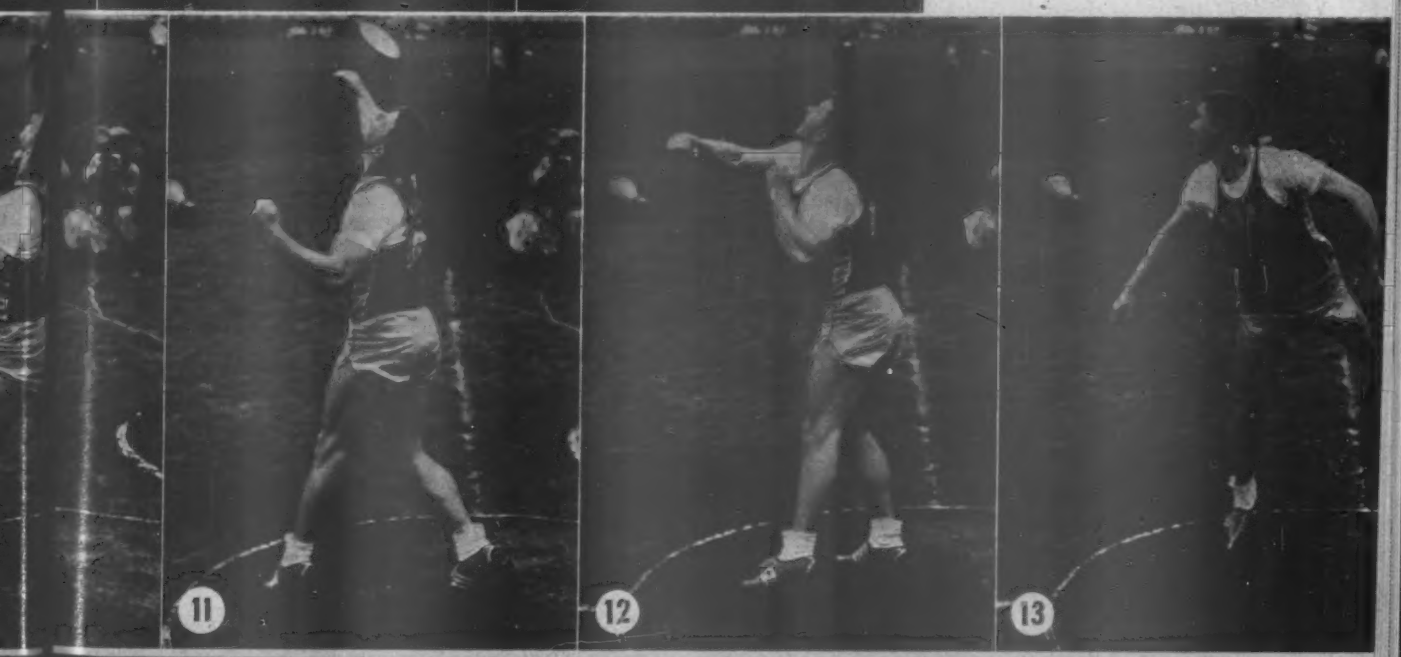
choice, but the average is three or four at the most.

When the final swing begins, the thrower's body takes an extreme twist to the right (as it should on all preliminary swings) and the discus swings well to the rear. At this point his body weight is over his right foot. When he is in this wind-up position, the turn is about to begin. As the body weight shifts over to the slightly bent left leg, the hips drop lower and the turn begins.

Roland Nilsson, who threw the discus 174 feet, when he was a student at Michigan, said he always thought of the turn beginning on the ground under his left foot, and by pulling his left heel counterclockwise he was able to get around his left leg faster. Ever since Nilsson developed this little trick, it has been used by all Michigan throwers. The heel is pulled, causing a pivot on the ball of the left foot, and the athlete comes around the bent left knee with his arm and shoulder trailing. His trunk is erect and his body is inclined slightly forward toward the front of the circle to aid in forward momentum. As the right foot starts over and around the pivoting left leg, the athlete must guard against swinging it in a wide arc. Rather, the bent right leg must come around and forward very close to the left leg. When the athlete completes a quarter of the turn, his left leg leaves the ground as it drives his whirling body forward. After one full turn has been made, both feet will be off the ground, because the thrower is now jumping down onto the previously bent right leg. At this stage the upper body must still maintain its twist to the right, the right shoulder and the discus must remain well back in a cocked position, the eyes are horizontal to the ground, and the trunk is relatively erect. The relatively erect trunk is one of the fundamentals of this style. A bent trunk during the turn means that the thrower's hips must pass through a wider arc as his body rotates, thus requiring a longer time to get into position and resulting in a loss of speed.

As the athlete's right foot comes down, 1¼ of the 1¾ turn has been completed. His foot is planted near the middle of the circle and as close





as possible to the diameter line. The actual horizontal pull on the discus starts the instant before the left foot comes down in the front of the circle. At this point the center of gravity is over the bent right leg that the thrower has hopped down onto. The athlete is now in the power position which has become so familiar to him as a result of throwing from the stand. His job is to blend the explosive powerful delivery he developed from the stand with the body and discus momentum developed from the turn and hop.

Minnesota Discus Style

While this particular style is often called the Gordien style or the Fitch style, it is more appropriately referred to as the Minnesota style, because it was developed and perpetuated by James Kelly, track coach at the University of Minnesota, and 1956 American Olympic coach. In addition to Gordien and Fitch, Minnesota has had many fine throwers who used this style. Byrl Thompson (174 feet), Charles Lindekugel (166 feet), Jerry Helgeson (165 feet), and Dale Yonkey (163 feet) are just a few. It is now firmly established that the form was not just a peculiarity of the two world champions, Fitch and Gordien.

The basic contribution made by Minnesota throwers to discus technique was to show the world that even greater speed and momentum could be used effectively than was ever attempted with a 1¾ turn. Therefore, the primary difference between the Minnesota style and the orthodox style is one of body mechanics which enables the thrower to get farther off balance during the turn, thereby taking advantage of the speed generated by a falling object. Yet the mechanics of the style enable the athlete to hop under the falling body into the power position for discus pull and delivery, and therein lies its advantage.

Jim Kelly credits the study of movies of Pete Zagar of Stanford University with providing the principle on which the Minnesota style is based. However, the refinements made with Fitch, Gordien, Thompson, and others went far beyond what Zagar used in 1938. These throwers tried to keep the center of gravity well ahead of, rather than slightly ahead (orthodox) of the point of balance which is over the feet. During the first turn in the circle exponents of this style, whether knowingly or not, lead the body off balance with the action of the head. For years gymnasts and divers who wish to control the body have emphasized that turning, dropping or lifting the head greatly facilitates body movement. In track and field, rarely do we read or hear of the important action the head movement can have in control of the body in action; however, head action is of great importance in many events. Athletes, themselves, when questioned concerning the use of the head, invariably confirm the opinion that head movement has a tremendous effect on their total technique. Fitch and Gordien start to turn and drop their heads as soon as they start into the turn at the back of the final discus swing. Consequently, the shoulders, trunk and hips are pitched out ahead of the feet as the body whirls and falls forward toward the front of the circle. Thus the turn starts with the upper body. In contrast, when the orthodox style is used, the center of gravity remains more over the feet. The turn is started by shifting the weight to the left leg and pivoting on the left foot.

The second basic factor in the Minnesota style is the ability of an athlete to hop around faster in order to get the foot and particularly the right leg under the body when the power position is reached. This position is partially accomplished by a much greater bend of the right knee than is used by Consolini, Drummond, and other orthodox throwers. The theory behind the extremely bent knee is, that the swinging right leg is shortened and the leg moves through a shorter arc thus coming around and down faster. In addition, this style offers greater speed and momentum during the turn for another reason. As the athlete is falling, the hop or drive off the left leg becomes more effective than it is in the orthodox style. This is true because force applied against a falling object, due to gravity, becomes proportionally greater with a greater angle of fall. The thrower's body is actually falling forward and drives from the left foot as he whirls. Thus speed becomes more of a factor than it does in the case of a more erect trunk.

One observation on the Minnesota style that seems to violate a basic principle of discus throwing is the absence of the erect trunk during the turn, which forces the thrower's hips through a wider rotational arc. In contrast, as shown in the orthodox style, due to the erect trunk, the thrower's hips travel a short rotational arc, thus giving him greater speed and momentum. However, exponents of the Minnesota style are quick to point out, that the off-body balance and the resulting quicker pull of the bent right knee enable the athlete to generate far greater momentum and more than offset the hips swinging through a wider arc. In addition, it should be pointed out that the leaning trunk and the extremely bent right knee make an even more effective power position possible as the athlete's center of gravity is lower throughout the action. Therefore, the danger of landing on a semi-straight right driving leg, at the end of the hop, is less likely.

While the Minnesota style may seem to be the ideal method, we must remember that it has more complicating factors and requires well-coordinated athletes. In addition, both Fitch and Gordien were mature men when they set their world marks. Fitch was a 25-year-old army veteran and Gordien was 27 years old when he established his world mark. Both men had spent years perfecting the intricacies of the Minnesota style. In the case of a devoted individual, this style may offer greater potential than any other, for if done properly there appear to be few limiting factors about the physics of the style.

Follow-Through or Reverse

As the thrower moves through the turn into the power position and then up into the actual delivery, he builds up momentum and speed. If he did not use his left leg to check and aid in converting the momentum of his lower body to his upper body where it can be applied on the discus, he would whirl right out of the circle and foul. Placing the left foot in the bucket, or too far off to the left of the front circle center makes this checking action impossible, and is the most common cause of fouling. Furthermore, unless the left foot is planted near the center of the front of the circle, the left leg can offer little eventual power to the delivery itself. If it is planted correctly, it not only checks the lower body, which causes the upper body to actually speed up in a whip action, but it assists in the final lifting action into the throw.

On well-executed throws the athlete rises high on his toes as the left leg, wrist snap, and finger force give the discus its final impetus. However, due to the great momentum, the braking action of a properly placed left leg is not enough. After the discus has left the index finger, the rotational action of the body continues to carry the body around and over onto the right foot. Rising on the toes of the right foot usually keeps the athlete in the circle, but some athletes such as Gordien had to drop low on the

(Continued on page 49)

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An Analysis of the Golf Swing

By JAMES J. SERI
De Paul University, Chicago, Illinois

Illustration 2

ANY consideration of the fundamentals of the golf swing must be concerned with an analysis of four broad major areas: 1. the golf grip of the left and right hands; 2. the golf stance and the position of the golfer's body in relationship to the ball; 3. the waggle and backswing; and 4. the downswing and follow-through. In order to develop a golf swing that will be consistent, powerful and rhythmically grooved, a golfer must master these four fundamental areas.

The golf swing is a complex skill which makes necessary the mastering of a series of coordinated body movements in order to obtain maximum power and consistency. These fundamental body movements must be understood and practiced intelligently through drills if a player expects to improve his game. Most individuals of average coordination are capable of breaking a score of 90 consistently by practicing correct fundamentals which should aid in the development of a desirable golf swing.

A thorough understanding of the proper execution of the fundamentals of golf should help in the development of good habits of play. It should be kept in mind that bad habits, which are practiced over a period of time, are difficult to overcome.

In this article, we will attempt to analyze and break down the fundamental movements of these four major areas.

The Grip of the Left and Right Hands

A proper hand grip is essential to a good golf swing since the golfer's hands determine the direction and path that the head of the golf club will take to contact the ball. Since his hands are the only part of the player which come into contact with the golf club, it is obvious that good hand and club relationship are necessary. A proper golf grip and the action that results from this grip help to develop a golf swing of maximum power and control. A correct grip enables both hands to work as a single unit to the top of the backswing. An improper grip will often result in loss of control of the club at the top of the backswing, and consequently a badly hit ball with loss of distance and direction on contact with the ball.

AFTER serving in the Pacific during World War II, James Seri entered La Crosse (Wisc.) State Teachers College where he earned 7 letters in football, basketball, and baseball. Graduating in 1948, he entered the coaching profession as basketball and baseball coach at Cashton, Wisconsin, High School. The following year he moved to Burlington, Wisconsin where he coached basketball and football until 1954. The next year was spent working for his master's degree at Wisconsin. In the fall of '55, Seri was appointed instructor in team and individual sports in the school of physical education at De Paul.

Illustration 1

There are two accepted golf grips in popular use today. These grips are the Vardon or overlapping grip and the interlocking grip. In our opinion, the overlapping grip is considered the more desirable of the two. This grip is used most effectively by players who have large hands and it enables the golfer to have a more compact grip on the club. The interlocking grip is used more often by individuals who have smaller hands. This type of grip, although used effectively by some golfers, does not permit as compact a grip as does the overlapping grip.

Following is an analysis of the salient points of the left-hand grip: 1. This grip is a combination of the fingers and palm on the handle of the club. A player should place his left hand on the handle so that it is pressed under the pad at the inside heel of his palm. Constant pressure should be applied on the handle of the club at all times with the palm of the player's left hand (Illustration 1).

2. From the muscular pad at the inside heel of the palm, the handle of the club should be extended diagonally along the palm between the first and second joints of the left forefinger.

3. The golfer's fingers should be wrapped around the handle so that pressure is placed on the last three fingers.

4. The thumb should be placed along the leather, slightly to the right side of the middle of the handle.

5. At this point a check of the following points can be made: The golfer's left arm should be straight and extended away from his body in an easy natural position. As he looks down, he should see either two or three knuckles of his left hand. The thumb and forefinger should form a

Illustration 3

tight *V* which points toward the golfer's right shoulder (Illustration 2).

6. The grip should be firm and have even pressure. A club should not be gripped so tightly that it causes a tightening or constriction of the muscles and feels uncomfortable to the golfer.

Grip of the Right Hand

1. A golfer's right hand should be placed on the handle of the club, and the center of the heel of his palm should rest over the middle knuckle of the thumb of his left hand.

2. The club should rest just below the palm of his hand between the first and second joints of his fingers.

3. His little finger should ride in the groove which is formed by the last two fingers of his left hand (Illustration 3).

4. Pressure should be applied mainly by the middle two fingers of his right hand.

5. A proper right-hand grip will result in a *V* which is formed by the thumb and forefinger of the golfer's right hand. With both hands on the handle of the club, a *V* which is formed by the thumb and forefinger of both hands should point in the direction of the golfer's right shoulder (Illustration 4).

Illustration 4

Golf Stance and Position of Address

It is essential for a golfer to assume the correct and balanced stance as he addresses the ball. A proper stance will enable him to have the solid foundation that is necessary to control his legs, arms, and body movements in a coordinated grooved swing, thus generating controlled power which is necessary in order to strike the ball effectively. For proper balance, his feet should normally be spread about shoulder width apart in a squared stance. A good golf swing is often determined by the position of the golfer's feet in relation to the ball and the intended direction of the ball's flight. The squared stance places him in a position so that his right shoulder is behind his left shoulder, and his right foot is behind his left foot parallel to the intended line

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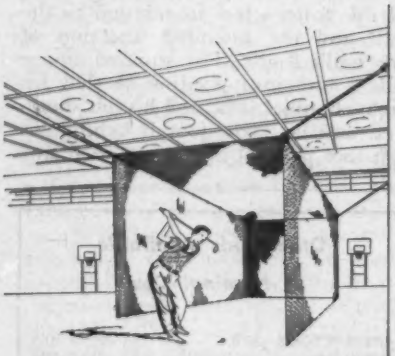

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Stances will vary according to individual differences. Some of the factors which determine stance and the relationship of the golfer's body to the location of the ball, are individual physical build, length of club, coordination, and the type of shot. When using a nine iron, a golfer stands closest to the ball, and farthest away from the ball when he is using a driver.

There are three basic stances that a golfer may use: the open stance, which places his left foot drawn back from the intended line of flight; the closed stance, which places his right foot drawn back from the intended line of flight; and the squared stance, which was mentioned earlier. Regardless of the type of stance used, the following points should be kept in mind:

1. A golfer's heels should be on the ground and his toes should be turned outward slightly.

2. His weight should be distributed evenly between the balls and the heels of his feet.

3. The knees should be flexed slightly and pointed inward.

4. His hips should be pushed forward slightly to avoid having his buttocks pushed out to the rear. He should attempt to keep his body as erect as possible.

5. The head and shoulders should be brought forward slightly so that the golfer's hands and arms hang free from his body. His left arm should be straight, but not stiff and tense, and should be fully extended at address. A straight left arm should be maintained throughout the entire swing until the ball has been contacted.

6. His elbows should be tucked inward toward one another. A player should attempt to keep as close a relationship as possible between his two arms and still maintain comfort. A close relationship of the two arms permits them to work together more effectively as a unit.

7. The sole of the club should rest flat on the ground with the face perpendicular to the intended line of flight.

8. Just before the start of the backswing, the golfer's hands should be pressed forward slightly to a position an inch or two ahead of the ball and the clubhead.

9. The position of addressing the ball should be one that enables the golfer to line up the ball off the inside heel of his left foot for the drive. To determine his distance from the ball, a beginning golfer should start with his hands positioned about 10 inches from his waistline. In order to judge this distance, he may use the left-hand grip as mentioned previously. By placing his thumb at the belt buckle and spreading the fingers apart, he may, by making a minor adjustment, have his hands in approximately the correct position.

The Golf Swing

In examining the golf swing, we must consider three phases: the waggle, the backswing, and the downswing. Basic essentials to a good golf swing which will be discussed are the footwork and shifting of the golfer's weight, his pivot or body turn, the hand action for club control, and follow-through.

The Waggle

The purpose of the waggle is to help relax the golfer prior to the start of the backswing. It is merely a short back and forth movement of the hands and arms which carries the club backward about 12 to 14 inches from the ball, and immediately returns the clubhead to a position behind the ball. This action may be repeated several times. Just before the backswing is started, the clubhead comes to rest on the ground behind the ball. At this point there is a shift or forward press of the golfer's body weight toward his left leg and his hands are moved forward an inch or two ahead of the ball. From this position he starts the backswing.

The Backswing

If a golfer has the correct grip, proper body relationship to the position of the ball, a comfortable and balanced stance with proper weight distribution, and correct positioning of his arms and hands slightly ahead of the ball, he can begin the backswing. The action of the backswing is an almost simultaneous movement of his hands, arms, shoulders, and hips in that sequence.

In examining the backswing, the following points should receive consideration:

1. A golfer's head should be positioned slightly behind the ball, and it remains stationary throughout the entire swing until the ball has been contacted.

2. He should start the clubhead straight back and low to the ground, about 30 to 40 inches, and have both hands working in unison.

3. Both hands should be kept locked together to prevent any wrist bend or rotation. His right hand and arm should be kept firm on the backswing

to a point where his right elbow and wrists break naturally at about hip height.

4. As the clubhead moves backward, the following movements occur simultaneously: The golfer's hands and arms should move in unison from his shoulders in a straight line. Both arms and elbows should be kept as close together as possible.

A golfer's weight should be shifted from the inside ball and heel of his left leg toward the inside ball and heel of his right leg. It is important that the mass of weight be kept between his legs rather than permit an overshifting of the weight too far to the right. His left knee should break slightly inward toward the right so that it is pointing directly over or slightly behind the ball. The golfer's weight should be carried on the inside ball and heel of his left foot. His right leg should be pointed slightly inward from the moment of address throughout the entire backswing.

About halfway back, and at about hip height, his wrists should break and remain cocked to the top of the backswing.

His shoulders should turn as far around as possible without destroying balance and comfort.

His shoulders should be turned, while his hips are restrained as much as possible. An excellent check to determine if he is making a proper shoulder turn is to see if his chin is contacting the top of his left shoulder at the completion of the shoulder turn.

At this point it is important to note that the golfer's head should be positioned behind the ball, and it should remain stationary throughout the entire swing until the ball has been contacted.

A golfer's hips must not be turned too soon. His shoulders should turn first, and they should initiate the lateral turn of his hips which should be restrained and kept to a minimum.

His wrists should be cocked naturally as they reach hip height and the following points should be given consideration: His right elbow should be positioned near the side of his body and pointed toward the ground. As the cocked wrists are continued backward, his right palm should be facing upward. His palm should be continued backward toward the right, bringing the thumb of his right hand toward his right shoulder. Then his right wrist should be bent inward, and the golfer should attempt to have his knuckles touch the back of his wrist. His right wrist and forearm should be positioned under the shaft of the club at the top of the backswing.

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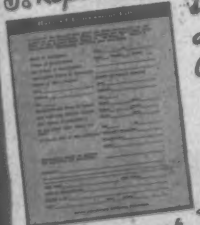

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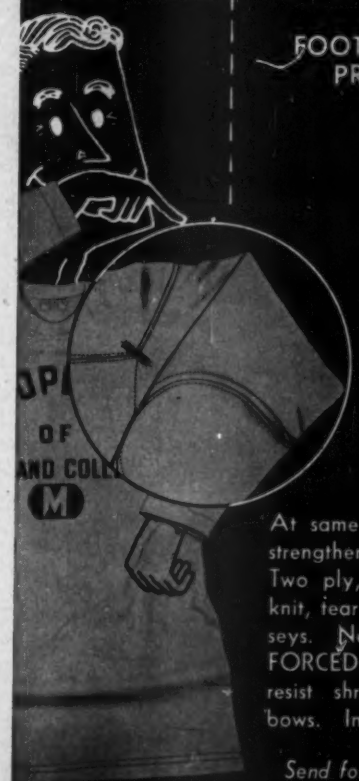

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A golfer's left arm should be straight, and at the top of the backswing there should be a slight inward break of his wrist.

At the top of the backswing he should check the following points carefully:

1. His hands should maintain a firm grip on the club.
2. His head should be slightly behind the ball, and should remain stationary until the ball has been contacted.
3. There should be an inward break of his right and left wrists.
4. The palm of his right hand should be upward, his forearm should be positioned under the shaft of the club, and his right elbow should be close to the side of his body.
5. His arms should be positioned as close together as possible.
6. The left knee should be pointed over or just slightly behind the ball.
7. His right knee should be pointed inward slightly, and his weight should be carried on the inside ball and heel of his right foot.
8. The shoulders should be rotated as far as possible to the right without destroying the comfort and balance of the golfer. His chin should contact his left shoulder at the completion of the backswing.
9. There should be a minimum rotation of his hips on a lateral plane.

The Downswing and Follow-Through

From the top of the backswing an almost simultaneous series of movements should occur, starting with a shift of the golfer's weight from his right toward his left foot, a forward thrust of his hips, a rotation of his shoulders and arms to the left, and finally a delayed action of his wrists and hands to obtain maximum whip and hitting power. The golfer should practice and develop a smooth coordinated downswing which operates in one continuous movement from the top of the backswing to the follow-through after contacting the ball.

An analysis of the downswing presents the following points for consideration:

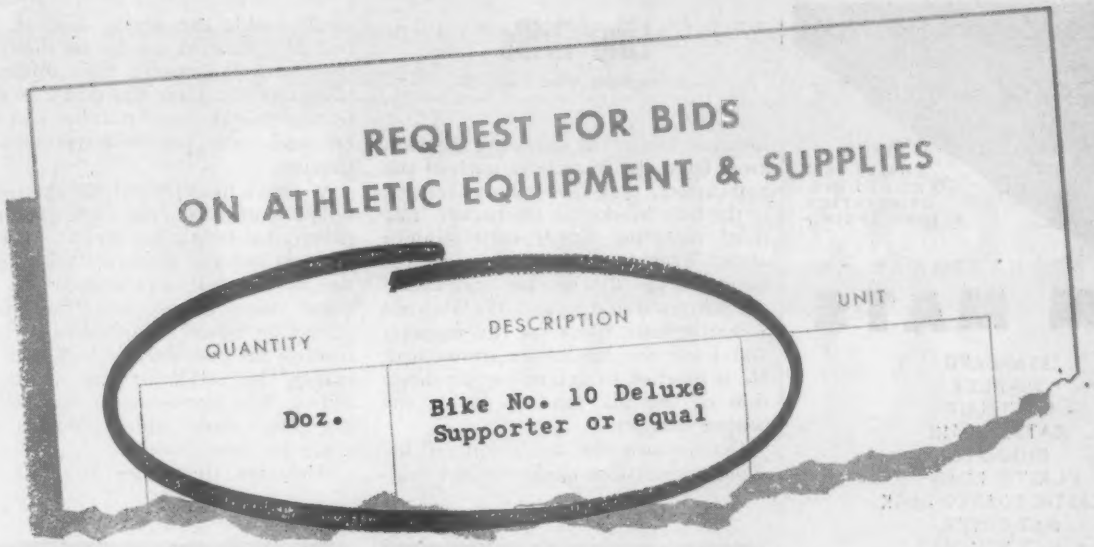
1. The start of the downswing should begin with the feet: Since at the top of the backswing the golfer's weight has been transferred to his right foot, the downswing should begin with a shift of his weight toward his left foot. To facilitate this action many professional golfers recommend that the golfer get his right knee moving to the left into the ball. His left foot should be flat on the ground to give him a feeling of hitting the ball off a firm left side.

2. His hips should be brought forward, with the left hip leading the way and starting the initial action. The shoulders should be rotated to the left. Proper hip and shoulder action should result in having his hands and clubhead pulled downward toward the proper plane of the swing. It is important that the initial action begin with the hips rather than permit his hands to start it. Initial action by the hands or excessive rotation of the hips to the left will usually place the golfer in a golf plane swing from the outside in, and result in a slice. Proper hip, shoulder, arm, hand, and wrist action should result in a golf swing from the inside out. This type of swing will result in a slightly hooked ball which produces greater distance on the shot.

3. His right elbow should be kept as close to his body as possible until his hands reach the hitting zone, which is slightly below hip height. His hands should be delayed as long as possible before contacting the ball.

4. As his hands reach the hitting zone, it is important

(Concluded on page 62)



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Line Drills

(Continued from page 8)

lineman blocks the defensive lineman away from the imaginary path of the ball-carrier, and the lineman closest to the hole blocks the linebacker. The third offensive player runs straight ahead. Each defender attempts to free himself from the blocker and tackle the correct dummy first. We also use a double-team block on the lineman and leave the linebacker untouched. He is coached to determine the direction of the play and to tackle the proper dummy.

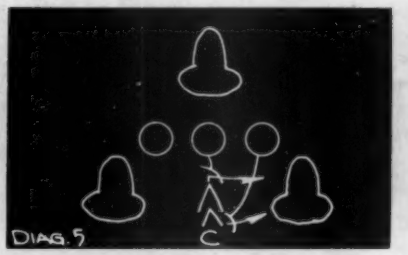
Occasionally the coach will call for a pass protection block and the middle lineman will block the player ahead of him, while the outside linemen assume a blocking position on the dummies. As shown in Diagram 6, the linebacker is expected to react to this type of blocking by retreating five to six yards as rapidly as possible. In this drill, all of the offensive linemen are considered as interior linemen, and the linebacker will not retreat if one of the three crosses the line of scrimmage to advance downfield.

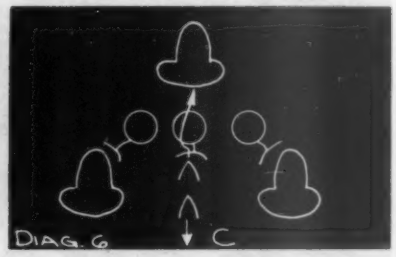
Because of limited coaching personnel, each new phase of teaching is started by working with only one group at a time. This method permits individual instruction at a time when it is needed most. When our defensive players are trained so that they rarely tackle the wrong dummy, we feel it is safe to set up as many as three groups between four dummies (Diagram 7). Thus the coach is able to supervise a larger number of players and each player receives more practice.

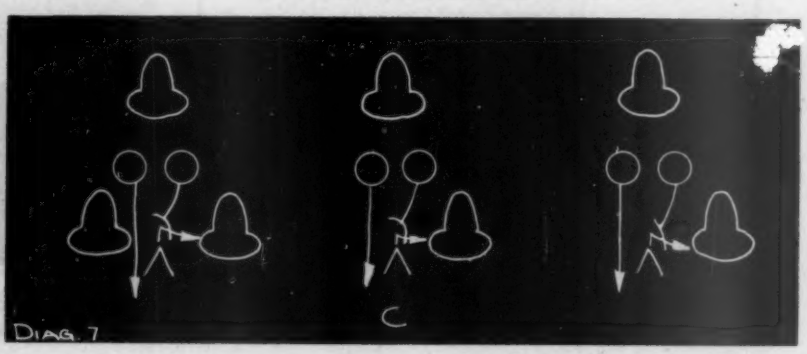
We have used these drills extensively and found they not only teach our players to determine the pressure of a block, but also give invaluable practice in the defensive maneuvers. Because there is no time limit, each player becomes accustomed to continuing his maximum effort until he makes the tackle or the whistle is blown. The players learn that tackles are often made after a blocker has made his initial contact.

Although this series of drills was designed to meet a specific defensive need, it has become our primary method of blocking practice. Equal attention is given to both offensive and defensive fundamentals. Corrections and suggestions are offered to all players by the coach. Excellent opportunity is provided to demonstrate that a blocker's job has only started with contact and a block must be maintained in order to be effective.

The players enjoy the competitive aspect of these drills, and because of the wide variety of skills involved, interest is maintained even during extended periods of time. Little time is spent on other line blocking drills since most of the fundamentals are well covered.







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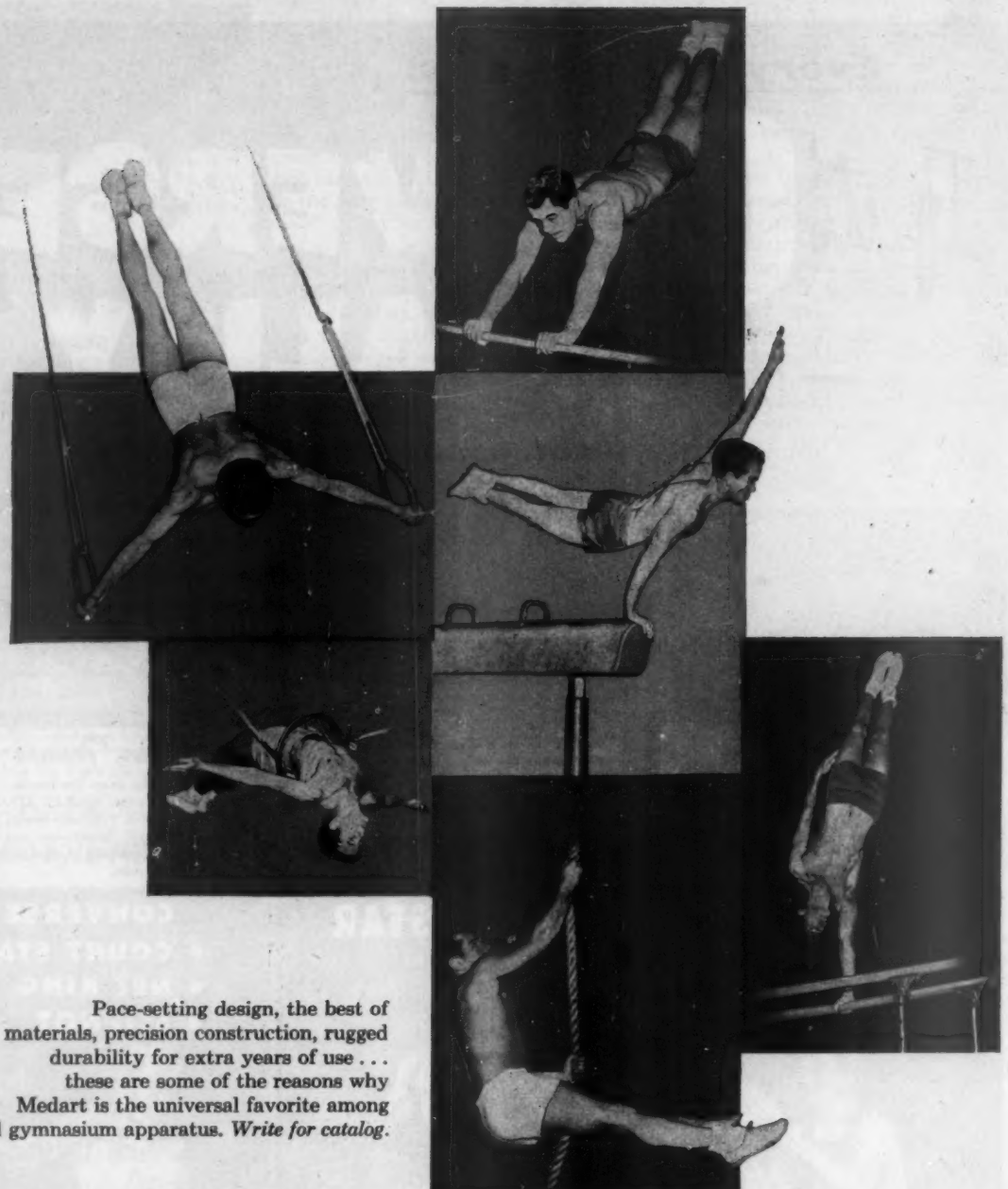

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The Discus Analyzed

(*Continued from page 38*)

right leg and then go into a series of hops to keep from fouling. In addition, exponents of the Minnesota discus style actually attempt to incorporate at least part of the reverse into the actual throw.

Some coaches do not feel that the average thrower should ever be taught to reverse early in his career so the momentum can be incorporated into power for delivery. Rather, orthodox delivery where the discus leaves the hand before the feet reverse should be emphasized. In fact, one of the common faults made by inexperienced throwers is their lack of understanding of the function of a reverse. Too often they reverse prematurely, and lose contact with the ground, before they have taken all the power from the drive up into the discus.

In the case of great athletes such as Gordien and Fitch, it may be possible to lose contact with the ground with the right leg at just the right moment, so that a little momentum from the reverse itself can be used effectively on the discus. However, the majority of discus throwers are not experienced enough to attempt it, and for these the reverse must only be a recovery action from the throw. In order to help prevent fouling, the feet should reverse, following the release of the discus.

Competitive Tactics

On meet days the coach should try to keep his athletes relaxed during the competition. This point is particularly true in throwing events because the natural inclination is to *throw it a mile*, and too often this desire leads to gritted teeth and a tenseness which makes maximum performance impossible. Almost without exception, after a great performance, the athlete has remarked, *threw easy* or *I didn't think I had a good one.* These observations are true because maximum performance is possible only when an athlete's muscles are relaxed, and it is only on rare occasions that the average athlete has a completely relaxed performance.

When athletes are confined to a circle, as in the throwing events, they are presented with additional competitive psychological problems. The fear of fouling is always present and competitive tactics should recognize this problem. Excitement, tension, and desire to *lose* the discus in flight are the causes of fouling. A thorough warm-up and a calm discussion with the coach before competition plays an important part in relieving this anxiety and tension. In addition, the athlete must always take his practice throws with a turn from within a circle (most major meets provide a practice circle for this purpose), to get the feel of the surface and the exact rhythm of the turn within the 8 foot, 2 inch area. The athlete who warms up and turns outside the circle can usually be expected to foul when competition begins. Going into the competitive area *cold* merely adds another problem when he starts to throw from the confined area.

The athlete should also plan to make his first throw in competition a safe throw. In the initial effort, concentration should be on relaxation, form, and rhythm and not on maximum distance. Often this so-called safe, relaxed throw is a fine one that qualifies the athlete for the finals, but in any case it grooves him for succeeding efforts. Sometimes the first throw is good enough so that he can explode on succeeding throws, and even take a gamble or two for distance. However, if the first throw is not one which grooves the athlete for later throws, and he attempts to go all-out on his initial appearance, a foul is often the result, because few athletes can settle themselves in major competition on their first effort.

Several other items should be considered when tactics for competition are being planned. Such things as keeping warm by exercise between throws, and using a raincoat, blanket, and towel in bad weather are elementary. The athlete must also pay particular attention to competitive conditions such as wind direction and temperature that may change during the meet. He must also check to see that meet officials smooth and level the circle area from time to time. The discus circle takes more hard wear than any other competitive area, and stepping, turning or landing in low spots made by previous competitors does not lead to efficient throwing.

Competition in threatening weather should also be given consideration. Many fine discus men have lost in competition in inclement weather or on poorly constructed circles because of their failure to concentrate on a good throw on the second, third or fourth efforts. Often the circle may be firm for these early throws, but impossible later in the competition due to wear or rain. When a situation of this type appears inevitable, concentration and a good throw during early competition become a vital factor in winning and losing.

Training Program for the Discus Throw

In most form events, athletes tend to undertrain rather than overtrain. The discus throw in particular is an event where few throwers ever reach their true potential as college athletes, and on the high school level it is just not possible to master this event completely due to physical immaturity and the brief years of training. It is interesting to note that Consolini and Gordien, the world's two most consistent discus greats, were in their prime when they were 30 years old and over, and after they had spent literally thousands of hours practicing.

Strength and body mechanics of throwing are the basis for discus training. Men like Gordien and Parry O'Brien placed great emphasis on the strength factor and did considerable weight training to improve their strength. However, both athletes spent as much or more time thinking and working on their actual discus throwing technique. To divorce strength from technique in discus throwing is impossible, and to decide that one area is more important than the other does not make much sense. However, every year we see big, strong athletes never reach their true potential because they simply do not realize, or possibly ignore, the correlation between championship performance and hard, fatiguing work in the discus circle itself. Consolini and Gordien are two of many concrete examples that years, and not weeks and months, of concentration are essential to world records and the approach to true potential.

Our finest discus men, almost without exception, had a passion for the event. Some like Iness, O'Brien, and Drummond gave up promising football careers so that they could concentrate on the discus throw during the fall months, and others have made similar sacrifices.

In approaching the actual training for throwing the discus, the experiences of the world's greatest throwers have recently revised and determined the program. Today across America at both the high school and the college level, discus men are spending more time in the gymnasium during the off-season on weights, parallel bars, and in the handball courts than they ever did before. As a result, the

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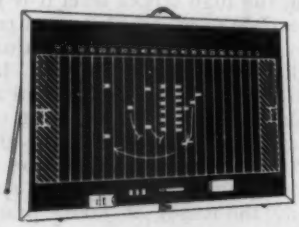

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discus standards continue to rise.

A discus aspirant simply cannot hope to approach championship stature unless he takes this scientific approach to the event. The use of weights and other gymnasium apparatus to strengthen the legs, arms, and torso, and speed games such as handball and badminton for coordination and speed are the basic off-season requirements. Too often, our finest discus prospects are excellent football players and a concentrated fall training program is impossible. If a fall training program is possible, it should be spent in concentrated work on technique and body building, with emphasis on throwing daily. It is just not possible for a thrower to become muscle bound, and a thousand or more throws during the fall constitute a big step toward reaching potential in track meets the following spring.

Ideally, an athlete's summer activity should consist of heavy labor or a gymnasium program for strength, and games such as tennis and handball to maintain and develop speed and coordination. Then when fall discus training time arrives, the athlete can spend a greater part of his time on the complicated technique of actual throwing.

The total amount of time a thrower can put in on actual practice varies. Roland Nilsson, when he threw for Michigan, often spent two hours during the afternoon in the discus area. On many occasions he put in more than half of this time in actual throwing from the circle. The remaining time was usually spent in warm-up and work on his other event, the shot put. We have seen Gordien, Drummond, Koch, and others throw constantly for an hour or more. While the novice would develop blisters and lose coordination due to fatigue on this program, we can see how necessary these men feel constant technique work is to them.

A final factor in the type of training discus throwers require must deal with speed. Contrary to the beliefs held in some quarters, speed can be developed with proper work in all events. In races on the track strength itself is speed, because as a man becomes stronger and has more endurance, he can carry a faster pace longer. As an athlete becomes stronger, the implement becomes lighter and he can handle it easier and faster. In short, he has developed speed of delivery by gaining strength. However, in discus throwing that type of speed is not enough, because speed and acceleration during the turn are vital. Constant thinking and practice work on trying to increase this rate of speed of acceleration must be done, for the greatest single factor in throwing is the proper application of the momentum built up by the turn. The increasing tempo of the preliminary swing, confidence in the turn, increased leg and body strength, and hundreds of well-executed throws all contribute to more speed for the thrower if he works conscientiously during his training periods.

The distribution of work throughout a week of training for a discus thrower is complicated by the fact that quite often he is also competing in another event such as the shot put. Assuming that he is a specialist with the discus, a training program for a week during mid-season might be as follows:

MONDAY (*Review Day*): Take a warm-up with thorough calisthenics and do enough jogging and short sprinting to break a sweat before doing any throwing. Start the actual workout by throwing at least ten throws from a stand. Spend the next half hour or so working on the mistakes made or difficulties encountered in the last Saturday's competition, so that the remaining practice time for the week can be spent on a sound basis. End the workout with a little sprinting, followed by a shower.

TUESDAY (*Distance Day*): The warm-up should be the same as it was on Monday. Throw at least ten throws from a stand in the power position. Then prepare mentally and physically to throw about seven or eight hard, fast throws for distance. If the form corrections made on Monday are constant with this hard throwing for distance, and fatigue is not present, as many as 15 hard throws can be taken. End the workout with some sprinting, followed by a shower.

WEDNESDAY (*Work Day*): The warm-up should be the same as it was on Monday. The practice time should be spent on hard, repeated throwing from a stand in the power position, and also with the full turn from the circle. This is the day that the athlete should extend himself in hard work. When fatigue sets in, speed and coordination decrease proportionally and turning in the circle should be stopped. If more work is desired, the athlete can end the workout with more stand throwing. The athlete should sprint a little, and then take a shower.

THURSDAY (*Form Day*): The warm-up should be the same as it was on Monday. An athlete may be a little tired from Wednesday's work and he should be starting to rest for Saturday's competition. This day should be spent on easy form work, and the

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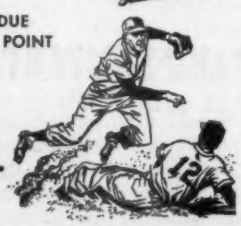

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areas he felt it necessary to concentrate on during Monday's workout should be repeated. If he is grooved, he can end the workout with one or two hard throws.

FRIDAY (*Rest Day*): Most discus men do nothing the day before competition. Some do take a light warm-up, but they generally stay away from the discus area.

SATURDAY (*Meet Day*): On the day of competition, a complete review of competitive problems and a plan for meeting them should be made prior to the start of competition.

Baseball Scoring

(Continued from page 10)

volved were placed after the words, *double out*, on the left. The same procedure was followed in the case of a triple out. A check mark was placed after the appropriate words if a pick-off, a steal, an attempted steal or a balk occurred, and after *infield fly* if an infield fly was ruled.

When a batter struck out, a *K* was placed after the *O* at the top of the right-hand column. In the case of a fly ball to center field, an *F-8* was placed after the *O*. A batter who walked was indicated by a *W* after the *1*, directly under the *O*. If he hit safely and received a double, a check mark was placed after the *2*, etc. All of this checking was in addition to the recorded action on the simulated field shown in the center of the chart. The purpose of checking the columns was to make it possible to interpret the chart at a glance. A coach could then look over the chart and make quick decisions during the game. Later he could study the play-by-play account more carefully and make decisions for future games.

Another advantage of this method of recording is the fact that it can be used to publicize the games. Sports writers, even though they are not present at the games, can use the charts to give accurate, interesting, play-by-play reports of the contests.

As an illustration, the chart on page 10 is reproduced to show an actual game situation. The wavy line indicating a bounding ball would be drawn on the actual chart in red.

Black was the first batter. The first pitch was a called strike. The next two were balls, one high, the other inside. Black swung at and missed the fourth pitch and fouled the next one back into the screen. He hit the next pitch into right field for a single. The right fielder caught the ball on the second bounce and threw to the sec-

ond baseman. The second batter was called out on strikes. The third batter drew a walk.

With the walk, Black went to second. This is shown by the encircled *W3* on the dotted line from first to second. The *3* means that the third batter received a walk.

While pitching to the fourth batter, the pitcher was able to pick Black off second. The pick-off play went from the pitcher to the second baseman, so the *1-4* is placed after the words, *pick-off* in Black's chart. The *4* in parenthesis indicates the player at bat when the play occurred.

Knee Injuries

(Continued from page 31)

planted on the ground with the knee bent.

A basketball player, making a running jump shot, lands on the side of his foot with his knee bent and heard something snap. Both athletes may, or may not, complain of their knees being locked. They may, or may not, be able to straighten their knees.

Symptoms: If the knee is locked, then swelling comes immediately. If the patient stands, he keeps his knee bent and his heel off the ground, with his weight on the ball of his foot. In examining the knee, push down on the patella gently, and there will be a sensation of resistance due to the wedging of bones. There will also be extreme tenderness over the side of the cartilage and along the medial collateral ligament.

Diagnosis: If locking takes place, diagnosis is easily confirmed, but where there is no history, or it is a transitory factor, then only generalizations can be made. The patient should be referred to an orthopedic surgeon for his diagnosis.

If there is locking in the joint, immediate reduction is necessary. If there is none, the injury should be treated the same as other lateral ligament sprains.

Immediate Treatment: If the tear is one that cannot be reduced, then an immediate operation is indicated.

If the reduction is successful, then we are dealing with a sprained lateral ligament. Careful attention must be given to physiotherapy to minimize quadriceps atrophy.

External Semilunar Cartilage or Lateral Meniscus Tear

Causal Factors: The player was hit on the inside of his knee, his foot was planted on the ground, and his knee was bent slightly.

Symptoms: The symptoms are the

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same as they were for an internal semilunar cartilage tear, except that there is tenderness on the outside over the site of the cartilage. There may, or may not, be a locked joint, depending upon the severity of the injury.

Diagnosis: Diagnosis should be based on the patient's history and an examination the following day. The patient should be referred to an orthopedic surgeon for his diagnosis.

Immediate Treatment: Treatment is the same as described for an internal cartilage tear.

The trainer who has a thorough knowledge of knee injuries will know what to expect when he hears the history of the injured athlete. He can visualize what probably happened and knows better how to approach the problem at hand. If there is any abnormal amount of lateral, posterior or anterior motion, the knee motion must be restricted at once. Where there is a locking of the joint, an immediate reduction is necessary. Certain findings on the field will warrant the immediate attention of an orthopedic surgeon. In any case, the injured athlete should be moved on a stretcher and a cold compress or bandage should be applied immediately to lessen the amount of hemorrhage. Since the trainer was present he knows the degree of seriousness, and it is his responsibility to see that the athlete receives proper treatment.

After application of a cold compress for a period of 24 hours more or less, then the application of taping serves a double purpose. Its primary objective is to force the fluid out of the joint and to help support the knee. The back of the leg is open; therefore, it does not interfere with the vascular system. Those patients whom the doctor does not feel it necessary to hospitalize are put on crutches.

Heat should not be applied for 48 hours after the injury and then should be used moderately. At first, just enough heat should be applied to increase circulation in order to start the healing process. Then the heat should be followed by a series of static exercises on the training table, where the patient tenses and relaxes his thigh muscles. A pillow is folded under the knee when the knee is flexed. The knee is actively extended with toes pointed, held for three counts, and returned to the flexed position. These exercises should be done three times daily, about ten to fifteen times, progressing as time goes on. As the knee becomes stronger, support should be removed from under it and the exercises should be repeated. The exercises should be in-

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creased gradually. Then the patient should recline on his back over the table, raise his leg and work on the hamstring muscles. The next progressive step is to add a 5 pound weight to the boot as soon as the quadriceps are strong enough. This weight should be lifted 50 times, and when the knee is fully extended, the position should be held for a count of three. The most important factor is full extension. Exercise should not be speeded up because the objective is to build up the muscle tissue. Increase the weight to 25 pounds and have the athlete lift it 50 times. Keep on increasing until a 50 pound weight can be lifted 50 times.

When the athlete is ready to resume running, at first he should run straight ahead, with no twisting or turning. After the lateral motion of the knee is normal, cutting is allowed with strapping or the use of an adequate knee brace.

The Hitter

(Continued from page 38)

in tight and *jams the hitter,* as Walt "Moose" Moryn of the Cubs describes it. When the pitcher is in the hole, he should get the ball over. When the batter is in the hole, he should pitch to spots.

4. *The change-of-pace is extremely important in successful pitching.* The art of hitting is dependent upon good timing. If this is true, the pitcher has the responsibility of upsetting the batter's timing, and he does so by changing the speeds of his pitches. Ed Lopat, the former Yankee southpaw, was sometimes termed a *junk thrower.* If they termed Lopat's assortment of pitches as junk, at least they should have correctly called him a pitcher because Eddie was a true pitcher out on the mound. His pitching success was due to his ability to change speeds. He had four or five speeds for each pitch, and we do not think they could be termed slow, slower, and slowest. Like Sal Maglie, Lopat would throw breaking pitches off the corner and get the batter off balance, and then he would throw his fast ball by the hitter. Few pitchers in the game can consistently throw the ball by the hitter, pitch by pitch. But, by mixing them up and changing the speeds on his throws, even the *junker* who cannot break a pane of glass at 15 feet, can occasionally sneak one past the fellow with the war club.

5. *If the hitter digs in, brush him back.* Del Crandall had this to say about the Braves' policy on this subject: *We never throw at a hitter, but*

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sometimes we do come in tight. The pitcher who keeps his pitches away from the hitter is only allowing the batter the opportunity to dig-in. Some observers believed that some of Roberts' recent difficulty was because he refused to brush the hitters back The best time to do this is when the count is two strikes and no balls.

6. *Pay close attention to the batter's position in the box, his stance, and stride.* Space will not permit us to cover this subject in detail, but the types of hitters should be studied carefully to detect their weaknesses. The catcher is in a perfect position to do this. For example, keep the ball away from an open-stance hitter. The fellow who crowds the plate will probably be weak on the inside pitch. In football, the old saying is, *when in doubt, punt.* Baseball pitchers are told, *when in doubt, throw the low curve ball.*

In conclusion, as the young pitcher progresses from sand lot ball to higher classifications, he has to stop being just a thrower. He must learn how to go to work on the hitter. If he feels he can just step back and fire against someone like Ernie Banks of the Cubs, he will be sadly mistaken. As the professionals say, *the batter will lose it for him.* Pitching requires all the trickery a pitcher and catcher can muster. We like to think of the manager who shouts out to his pitcher from a seat in the dug-out, *Go to work on him.*

The Serve

(Continued from page 18)

much, if at all. Here again, Lloyd Budge is presenting a picture of the racket being too low. The racket actually continues upward to make a semi-circle behind the player's head as the others indicate. We do not believe the racket handle should dangle loosely in the player's hand. Combined wrist and forearm action should do the dipping.

Tilden is wise in stressing *swing.* The serve motion should be a swing from the start to the finish just as are the forehand and the backhand.

The serve is the same as the overhand pitch in baseball. If a coach is having difficulty getting the serve across to one of his students, he should have the boy take an old racket and practice by actually throwing the ball over the net.

Forward Swing

Don Budge — As the racket comes forward overhead, the player should

pull himself up on the toes of his left foot to gain maximum height at impact. Now his forearm straightens out vertically, carrying the racket the maximum distance above his head in the forward motion which represents the peak of the swing's acceleration. An instant before contact is made with the ball, the player's left foot pivots slightly to the left from his toes.

Helen Jacobs — Again, without a break in the rhythm, the forward motion begins, and the player's body starts its turn back toward the left.

Lloyd Budge — From a break in the pendulum backswing, the racket starts on its stroke forward to meet the ball. As the stroke is made, the player's wrist is snapped into the ball.

Bill Tilden — Throw the flat face of the racket against the ball.

Ellsworth Vines — A player's body begins to turn toward the net, accentuating his weight coming into the shot. His wrist will give a forward snap just before impact. As the racket comes up to meet the ball, the player's left knee begins to straighten out slightly. His body is supported by the toes of his left foot, giving height and trajectory to the stroke.

Jack Kramer — A player's body weight should go forward with the swing.

Comments: The final power in the serve comes from the player's forearm and wrist whipping the racket into the ball, and as some of our experts have indicated on the flat serve, the racket must be brought to a point behind the ball as soon as possible. In order to give students a feeling of this whipping snapping motion, instruct them to hold the racket at the tip behind their bodies in line approximately with the point of contact. Then tell them to tear it loose.

The feeling in this action is similar to hammering a nail as high as a player can reach. The racket should come into the ball with its edges perpendicular to the net. The player's wrist does the work of straightening out the racket so that its edges are approximately parallel to the net at contact.

Hit

Don Budge — As the ball is struck, the racket is inclined forward slightly. The degree of tilt varies according to the height of the player. Flat service is made with the face of the racket completely open. The ball should be hit from behind and slightly above.

Helen Jacobs — A player should rise up on the toes of his left foot in order to reach maximum height at

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the moment of impact, because what he actually wants to do is hit down on the ball, rather than out on it. Just as he hits the ball the racket head inclines forward, his body weight bends forward, and his right foot, which has been raised from the ground, swings forward to a position almost opposite his left foot. The forward inclination of the racket head brings the ball into the court, and can be regulated according to whether the player's services are going to be in or out.

Lloyd Budge — The ball should be met slightly in front of the player's forward shoulder and far enough to the right so that his right arm clears his body freely. In contacting the ball, the bevel of the racket should be almost straight up and down. Then, as the racket continues forward, the top covers the ball to bring it down to the desired height.

Bill Tilden — The racket head meets the ball on the upper back surface and hits directly through it. A player should keep his eyes fixed on the ball as he hits.

Ellsworth Vines — At the point of contact, the player's left knee is straight, his back has turned into the shot, and his arm is extended fully.

Jack Kramer — At impact, the player's body should be facing the net. He should hit the ball with the flat of the racket open-faced. Upon hitting the ball, the player's right foot should be drawn up closer to his left, and he should reach as high as possible.

Comments: As is true in the forehand and backhand, there is a hitting area in the serve. The racket should line up behind the ball, and the point of contact and the follow-through should be in the area over which the racket directly follows the ball. The longer this whole action is, the more effective will be the serve.

We prefer, instead of Helen Jacobs' *hit down on the ball*, the idea of hitting up and out on the serve. The player may get a feeling of hitting down on the ball, but we do not believe it is possible, considering average height, to do this and place the ball in the court.

It is important to get across the point that the ball is contacted at the peak of the arc the racket head makes as it swings up into the ball.

In checking faults, the throw should be checked first. If it is too far forward, balls will be going into the net; if it is too far back, balls will be over the service line. But if the throw is correct and the balls are going over the service line, then the player's weight may be coming in too fast (changing the arc of the swing). The opposite is true if the balls are going into the net. The inclination of the racket also affects the throw. On the flat serve, it should be approximately perpendicular to the ground and should bevel forward somewhat as the racket goes out on the ball.

The end of the flat serve is a natural aftermath of sound action in the hitting area and should be to the left side.

Second Service

Don Budge — In the slice, the racket head comes around the outside of the ball and hits across the left as well as down. For the American twist, the toss is over the player's left shoulder. The face of the racket is brought sharply over the ball from left to right.

Helen Jacobs — For the slice, throw the ball slightly lower than in the case of flat service and more to the right so that the racket face can move down and across the outside surface of the ball. In the American twist, throw the ball the same height as in the flat service, but more to the left, approximately over the left shoulder. As the racket swings up to meet the ball, the upper edge of the frame is tilted slightly forward. The strings strike the ball just below its center, and more sharply across and up the back surface. It is chiefly the wrist which whips the racket face up and across the ball in this way, although the player's arm also plays its part. The follow-through ends with the racket face well above and to the right of the point of contact.

Lloyd Budge — In the slice, the ball is tossed a foot to the right of the point used in the flat service. The spin is sharply across from right to left. In the American twist, toss the ball a foot to the left of the point used in the flat service. The spin is from left to right. A player's back must be arched.

Bill Tilden — In the slice, a player should toss the ball slightly to the right of his head and about eight inches forward. Hit it on the upper right surface. The stance is the same in the American twist, but the backswing carries the racket head behind the player's back which is bent. The ball should be tossed to the left of his head and on a line parallel with it as far as the net is concerned. The racket head comes from below, meets the ball on the lower left surface, hits up and over it with a distinct wrist kick, and ends on the right side of the player's body. In order to keep his balance, the player's right leg should come up first about the time the ball is met, and should be extended in

front of his body following the line of the racket during the hitting up and over part.

Ellsworth Vines – In the slice, the player's back is hardly turned, and the ball is tossed well to the right in preparation to his body coming around outside of the ball. The player's right arm is not extended as fully at impact, nor is his body as nearly sideways to the net as it was for other serves. A player's back is turned more in the American twist, and the ball is tossed somewhat farther back. There is definitely a greater bending of the player's back. The racket comes across the ball. In the follow-through, the racket is more definitely following down on the right side of the player's body.

Jack Kramer – In the slice, a player should toss the ball slightly to the right of his head and shoulder. He should bring the racket down and across his body. In the American twist, his body should be sideways to the net a little more than in the other serves. When a player hits the ball, he must bring his arm directly out to the right. The ball is tossed farther back overhead and slightly to the left. Then the racket comes inside and to the left of the ball which is hit with a snap of the wrist, and in an overspin motion. Follow-through is down and to the right of the player's body.

Comments: The overspin or topspin serve was omitted and it should be mentioned. It is simpler than the American twist and is used more extensively today as a second serve than the American twist or the slice.

The ball should be thrown more to the left and not so far forward as on the first serve. About over the head would describe it precisely. The player's toes need not be quite as high because the racket should go up over the ball. However, the forward side of the racket, not the tip as in the flat service, accomplishes this action, thus giving a greater factor of safety. The racket ends in front rather than to the right or left side, as is the case in all the other serves.

It is important that a player have a full variety of serves in order to keep his opponent off balance on the return of a serve or to be able to give him the one ball he finds most difficult to handle. For instance, if he likes to hit his backhands close and low, the American twist would be a natural choice, bouncing high and away as it does. If he prefers his forehands close, then a good slice serve can be most effective.

The importance of the second serve cannot be underestimated. Bobby Riggs claims that Kramer defeated him with his second serve, not his first. Backing up the first ball with a deep, spinning second serve is of great importance.

From Here and There

(Continued from page 4)

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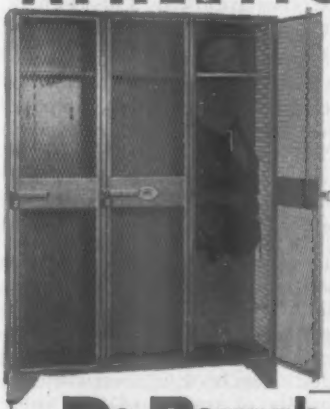

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New Books

Physiology of Exercise, *by Laurence E. Morehouse and Augustus T. Miller. Published by C. V. Mosby Co., St. Louis, Mo. Three hundred and forty-nine pages. Publication date Jan.* 5. *Received for review Feb.* 10. *Price* $4.75.

The first edition of this book appeared in 1948, and the second edition five years later. This third edition represents an extensive revision made necessary by recent developments in electronic, biochemical, and photographic instruments of research. The more sensitive instruments of observation have disproved many of the old theories regarding the functions of the body during physical exercise.

Developing an Offensive Attack in Basketball, *by Stan Watts. Published by Prentice-Hall, Inc., Englewood Cliffs, N. J. One hundred and ninety-two pages. Received for review Feb.* 2.

Stan Watts has had an amazing coaching record at the high school, junior college, and university levels. He is one of the seven coaches in the country whose teams won over 100 games in his first five years of college coaching. This book shows clearly Watts' knowledge of the game. Culled at random, these are but a few of the points discussed: "how to make the lay-up almost automatic; six important points in teaching the one-hand shot; the two ideal situations for using the jump shot; getting the ball to the big man; teaching the big man to fake and hook; and teaching the small man to hook."

There are over 200 diagrams, which combined with the author's know-how and writing ability, make this truly a fine basketball text.

The New YMCA Work Book. *Published by Association Press, New York* 7, *N. Y. Publication date Jan.* 1959. *Received for review Feb.* 2. *Price* $11.50.

Bound in a three-ring binder, the material represents a number of separately bound units. They are as follows: Understanding and Operating an Aquatic Program; Materials Used in the Aquatic Program; New Program Emphasis from Third National YMCA Aquatic Conference; Aquatic Program in the Small Nonequipment YMCA; Philosophy of the National YMCA Aquatic Program; History and Development of YMCA Aquatics; Learn-to-Swim Campaign; Recognition of Heroic Service; Principles of Construction and Maintenance of Indoor Pools; YMCA Pools; National YMCA Swimming and Diving Championships; and a plastic-coated chart which gives detailed information on the YMCA Aquatic Program, with the reverse side showing the various emblems and insignia.

Football for Young Champions, *by Robert Antonacci and Jene Barr. Published by McGraw-Hill Book Co., New York* 36, *N. Y. One hundred and fifty-nine pages. Received for review Dec.* 17. *Price* $2.95.

Bob Antonacci is the director of the physical education program in the Gary, Indiana schools, while Jene Barr is a teacher in the Chicago public schools. She has written several books for children. This book is designed to acquaint the younger children with the game of football. The rules are discussed, some of the history of the game is recounted, tips on playing the various positions are given, and drills and exercises are listed. This is an excellent book for every grade school library.

Archie's Little Black Book, *prepared and published by H. Archie Richardson,* 1234 *North Formosa Ave., Hollywood* 46, *Calif. Ninety-six pages. Publication date Jan.* 15. *Received for review Jan.* 15. *Price* $1.10.

This is the sixth edition of this excellent interest-arouser for track and field. Many of the pictures of the fifth edition, published two years ago, are retained and many new items are included. The book is a veritable encyclopaedia of track and field information and throughout there is constant reference to the theme, *don't be discouraged.* The author points out numerous great track athletes who overcame obstacles to become champions and cites illustrations of high school athletes who went from medio-

crity to greatness. We strongly urge every track coach to secure several copies for the members of his track squad to read when on trips, in the training room or between practice sessions.

The Science of Coaching, *by Clair Bee and Ken Norton. Published by Ronald Press, New York* 10, *N. Y. Publication date Feb.* 1959. *Received for review Feb.* 5. *Price* $2.95.

This second edition covers the basic tyles of offensive and defensive play, nd then offers methods of combating hem. With the help of 155 illustrations, special techniques such as playng the fast break or possession game, oping with defensive floating, and sing signals are described in step-by-tep fashion. Important tips on conditioning and training are given, as well as methods for selecting squad nd team members. Foreword by "Doggie" Julian.

Individual and Team Basketball Drills, *by Clair Bee and Ken Norton. Published by Ronald Press, New York* 10, *N. Y. Publication date Feb.* 1959. *Received for review Feb.* 5. *Price* $2.95.

This second edition presents the methods by which practice time can be utilized most efficiently and with the best results. These drills help the player master the fundamentals and aid the team in developing close coordination. Included are special drills for the big man, warm-up drills, and fast break team drills. Carrying a foreword by Pete Newell, this book contains 197 illustrations.

Zone Defense and Attack, *by Clair Bee and Ken Norton. Published by Ronald Press, New York* 10, *N. Y. Publication date Feb.* 1959. *Received for review Feb.* 5. *Price* $2.95.

This book covers the development of the various zones, their application, and methods which are used to oppose them. The authors use 215 illustrations in conjunction with the text. They show how to attack each zone using several offensive formations. Featured is a new pattern attack, which with a few minor adjustments, may be used to penetrate any zone. Foreword by John Niciatola. Second edition.

Basketball Fundamentals and Techniques, *by Clair Bee and Ken Norton. Published by Ronald Press, New York* 10, *N. Y. Publication date Feb.* 1959. *Received for review Feb.* 5. *Price* $2.95.

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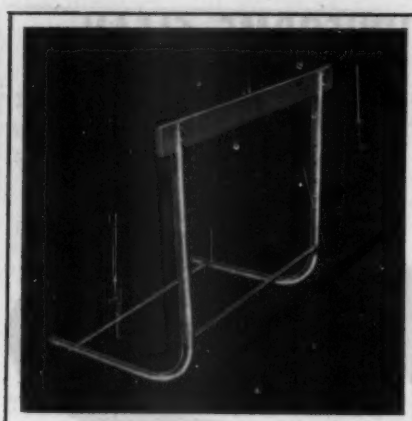

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This book is also a second edition and contains 122 illustrations. Every basketball fundamental from footwork and dribbling to shooting, rebounding, and retrieving is explained and depicted. Using competitive game situations, the authors start with the individual and work their way up to team play to insure the maximum effectiveness of each technique. Foreword by Ned Irish.

Man-To-Man Defense and Attack, *by Clair Bee and Ken Norton. Published by Ronald Press, New York* 10, *N. Y. Publication date Feb.* 1959. *Received for review Feb.* 5. *Price* $2.95.

The authors have used 186 illustrations to clarify the text which deals expressly with the offensive and defensive maneuvers employed in man-to-man situations. Emphasizing personnel, complete coverage is given to the variations of style and formations. There are special sections on defending against the fast break and other attacks. Foreword by Asa Bushnell. Second edition.

Golf Swing

(Continued from page 44)

that maximum wrist action be utilized.

5. Throughout the entire swing, from the position of address to contact with the ball, it is absolutely essential that the golfer keep his head behind the ball. Head movement of any type should be kept to a minimum.

6. Proper follow-through on the golf swing will result in the golfer completing his shot so that his belt buckle will be facing the hole. His weight should be shifted to his left foot, and his hands carried over his left shoulder, with his right hand positioned above his left hand.

Sprint Start

(Continued from page 12)

maximum potential forward thrust from the *set* position.

Taking the Marks

Beginners may be uncertain about which foot to place on the front block. This predicament can be solved by asking the runner to go through

a pantomime of a football punt or a conventional high jump. The drive or take-off foot (not the kicking foot) is in most cases the foot which will be most effective on the front block.

The blocks should be set and tried, and the sprinter should be ready when the starter calls the runners to their marks. At the command, the sprinter assumes a relaxed five-point position by kneeling on the knee of his back leg. His knees should be directly in line, the balls of his feet should be placed solidly against the blocks, and his toes should just touch the ground. Relaxation can be practiced at this point by shaking the hands and wrists just before placing them behind the starting line. A bridge should be formed between the thumb and the fingers as the hands are placed parallel to the line. The arms should be straight to form a solid support for the body. In this position concentration on the starter's commands and upon control and relaxation are most important. Dropping the head and keeping the jaw, neck, and shoulder muscles loose will help to eliminate all stimuli but the commands of the starter and the sound of the gun.

Getting Set

At the command *get set,* the sprinter raises his knees and hips as he leans slightly forward to assume a four-point position of balance and poise between his feet which are against the blocks and his hands which are on the ground. His hips should come up to at least shoulder height if not slightly higher, and his arms should be brought to vertical or slightly more forward of vertical at the shoulders. Periodically, the coach and the sprinter should review certain check points:

1. Check the sprinter's foot alignment on the blocks. The heels and the balls of the feet should be straight up and down, and the toes should just touch the ground.

2. Check the straight-forward alignment of his body. The knees should be directly in front of the feet on the blocks, and the arms should be in line with the shoulders.

3. Check the angle between the lower leg and thigh of his front leg. More or less than 90 degrees will permit less than maximum forward drive.

4. Check the position of the sprinter's arms. If they are unsteady or if they bend at the elbows, the forward lean may be too great. The starting blocks may need to be moved back a few inches to permit a more forward position of the hands. For the sprinter who might still have difficulty in supporting his weight, it may help him to lock his elbows (not stiff) and to rotate them toward his chest.

5. Check the shoulder and neck muscles for absence of tension. Notice the difference in tension in Illustrations A1 and A2.

6. Check the sprinter's breathing habits. See that he inhales as he moves into the set position. Then he should exhale a little and hold his breath until the gun is fired or until the starter calls him up.

Murchison's powerful arms permit him to exaggerate the forward lean (Illustration A1). This gives him the feeling of being ahead even before the race begins. With his controversial straight but relaxed back leg barely in contact with the rear block, he has eliminated one motion in the movement of his leg, that of straightening a conventional bent back leg before bending it again as some sprinters do. Murchison merely rests his back leg on the block and he is able to bring it up more quickly to a bent position at the stimulus from the sound of the gun. He feels he can combine the

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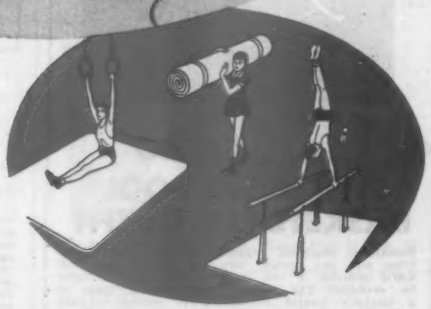

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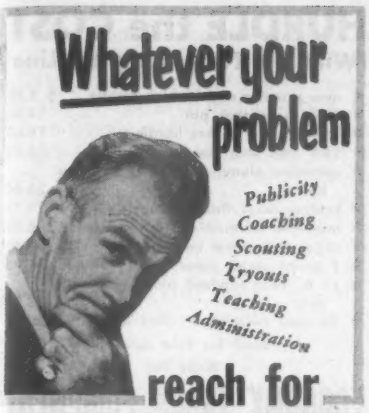
GEORGE DALES graduated from Miami (Ohio), and has been at Western Michigan since 1953. Currently his team is the defending Central Collegiate indoor champion, and is the defending Mid-American Conference track champion. Last fall's cross-country team was second in the NCAA.

drive-off from the front block by the strong front leg with the *running-out* of the block by the relaxed back leg. Notice the difference in the contracted and relaxed calf muscles in Illustrations A1 and A2. Furthermore, he has an advantage in being able to assume the same leg and hip position at the set position before each start.

At the Gun

At the crack of the gun we can clearly observe how and why Murchison has been labeled the fastest starter in the world. He achieves maximum forward thrust with the drive from his front foot. His hand and arm on the side of his front foot swing forward and up while the opposite upper arm and elbow swing back to a point where they are visible from his back (Illustration A3). His back is straightened forward as it continues parallel to the ground.

The knee of his back leg reaches forward and up until his thigh is at least at a right angle to his upper body, while the drive leg on the front block has reached maximum extension (Illustration A4). A straight line can be extended from the front block through the ball of his foot, ankle, knee, hip, shoulder, and head. The relaxed opposite leg has come up from the rear block and it drops just ahead of the starting line where it now becomes the front and driving leg. It in turn drives forward to maximum extension as if it were driving from a front starting block. Again, a straight line can be extended from the ground through the body as before. We superimposed the negative from Illustration A4 on Illustration A6, and found no visible increase in body angle although Murchison's legs and arms have alternated positions a full stride. The only observable change is a slight rise in the focus of his eyes a bit farther down the track toward the finish line. Murchison's ability to maintain his lean in the early stages of the sprint and his ability to combine this with a high knee lift gives him a powerful thrust with each stride.



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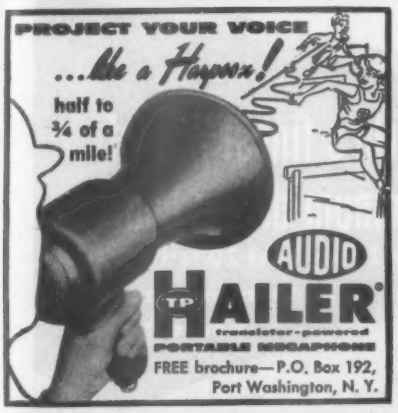

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In conclusion, sprinters can be coached to good starts with intensive practice at least three days a week using a gun, but only after a thorough warm-up. Before any serious running, Murchison warms up for 45 minutes to an hour. His practice schedule includes starts three times a week after four to five weeks of preliminary conditioning in the form of stretching and bounding exercises as well as jogging, striding, and overdistance running interspersed with short bursts of sprinting. Starts are practiced following one-half of the planned workout for the day. We begin with four to six starts on Tuesdays early in the indoor season in December. Murchison builds up to 15 or 20 starts on Thursdays through March. In April we begin to work outdoors when the weather permits. All starts after the first two or three are competitive, and they are run at full effort through 50 or more yards. Following the practice session on starts, the second half of the planned workout for the day is completed.

Developing Kickers

(Continued from page 7)

through his step routine, drop the ball to the ground or floor, and note how it bounces. If it bounces straight up, it has been dropped properly. The ball should be released simultaneously by both hands. Then the hands should swing out to about 45 degrees from straight ahead. This movement tends to aid balance. Erratic hand movements tend to require that the kicker compensate by some other movements of his body, none of which contribute to kicking perfection.

A player cannot always carry a football about to practice dropping and kicking, but the leg snap and the timing can be developed by kicking a small rubber ball to which a rubber string is attached. This type of ball can be found in a variety store and is commonly called a *come-back* ball. The kicker should hold the string in his right hand, leaving plenty of slack. He should let the ball rest in the cup of his hands, drop it, and after completing the rocker steps, kick it. Simple as this suggestion may seem to be, it will accomplish several objectives. First, the importance of keeping the eye on the ball becomes apparent through practice. Second, it will help the kicker learn the skill of timing, because it is easy to determine if contact took place the instant that leg snap was attained. The kicker will readily see the effect of kicking this

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little rubber ball with his toe, his instep or on the outside of his foot. Surprising as it may seem, should the kicker miss the ball, the effect is similar to that which results when a football is kicked and missed. This practice also helps to develop the kicking leg much faster than when a player kicks a regular football and then has to walk a distance to recover it before kicking again.

Elevating the Toes

When kicking a football, it is recommended that the punter practice elevating his toes at the moment of contact between his instep and the ball. This will make the ball spin backwards and go almost straight up into the air. If the kicker has no one to work with him, he can practice catching his own kicks. In any event, he will acquire more foot control through this rather elementary practice. He will come to know that he can make the ball do what he wants it to do.

Learning to kick the ball so that it rolls straight involves only a slight adjustment of the ball so that it contacts the instep at a point slightly higher up and square away. Perhaps the theory of rolling the ball out of bounds will again find favor if a trend of defensive play toward the use of a single safety man continues. It is difficult to roll a kick out of bounds with a long roll against twin safeties. However, a straight-away roll quick kick, over the safety man's head, is a maneuver which even the youngest spectator is able to appreciate.

A coach may instruct a punter to kick to the safety man and, as mentioned previously, the kicker should always practice placing the ball on a specific target. The ability to place a ball in a position where a receiver finds it more difficult to handle will pay dividends, because many right-handed players have more difficulty in running to their left to catch a ball. If a receiver likes to run only to his left or to his right, the ball can be placed in a spot which is not to his liking.

When emphasis is placed on team punt return, an out-of-bounds punt will bring a quicker whistle and nullify some of the practice hours the opponents have spent on mastering this offensive weapon. This is actually one of the few offensive weapons that the defensive team can overcome without too much trouble. A kick-off over the end line will nullify the return offense, and the on-side kick will tend to limit it. Most other offensive methods of attack must be halted after they get underway.

When kicking from deep in the end zone, the kicker must take a position

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far enough in front of the end line so that when he executes his rocker step he does not step over into the safety zone. This is a simple matter because it involves being only a few feet in advance of that line. The punter should know his ability, and he must not lose his poise or form and attempt to kick the ball to the other end of the field. He should not try to do something he is not capable of doing, and which causes him to deviate from his kicking form. Very often the only advantage gained from trying for a long kick out of danger is that the ball advances far downfield and the runback nullifies the advantage which was gained temporarily. This is partly true since the kicking team must place emphasis on getting the kick away rather than trying to get good coverage.

If a kicker knows that he can kick 50 yards, and gets the ball out of bounds near midfield, he has accomplished his mission. The coaching staff and the team can plan accordingly when they know they have a dependable kicker, and the hours spent on pre-season practice will pay big dividends every time.

The value of controlled kicking is evident once a team gets near midfield. A good punter who can hit the coffin corner, under any game condition, is indeed a most valuable offensive threat. His efforts can be measured in yards gained, and in the demoralizing effect they have on the opponents who are forced to call plays repeatedly from deep in their own territory.

In concluding the suggestions to punters, a suggestion to punt catchers is in order. Every effort should be made to practice catching kicks from a left-footed kicker. The ball that is kicked by this type of kicker is a different one to handle from that normally received. This may seem to be a small detail, but a dropped punt, while not serious in practice sessions, could easily be costly under game conditions. Players should be acquainted with the characteristics of a ball coming at them in a clockwise spiral.

We consider the quick kick to be in a special category. It is a play which will nearly aways guarantee a gain of 50 yards or more in exchange for loss of possession of the ball. Usually, when the weather conditions are unfavorable, the quick kick has more value, because regaining possession of the ball is more likely under conditions where ball-handling risks are higher. If possession of the ball takes place deep in the opponent's territory, the purchasing power of the pigskin goes up, because the striking threat of the offensive team is increased by the proximity to the opponent's goal, and the psychological value of regaining possession in that situation is well understood by the coach, the players, and the spectators.

Another value of the quick kick is that it is seldom returned, and the time spent by the opponents in developing a punt return as an offensive weapon is nullified.

If a quick kicker is right-footed, he will step back from his original position, four to five yards from the center, with his right foot and then his left foot, to give him depth, in the initial stages of the quick kick. The center delivers the ball to him with an end-over-end pass. Since the center positioned the ball with the strings to the right, the ball reaches the kicker with the strings to the right, and is ready to be kicked without adjustment. Many kickers feel it is necessary to adjust the spiral-type pass from the center to get the strings on the ball positioned on top of it. Thus the end-over-end pass from the center saves time.

After receiving the ball, the kicker steps forward with his left foot and kicks. His left foot is a pointer foot,

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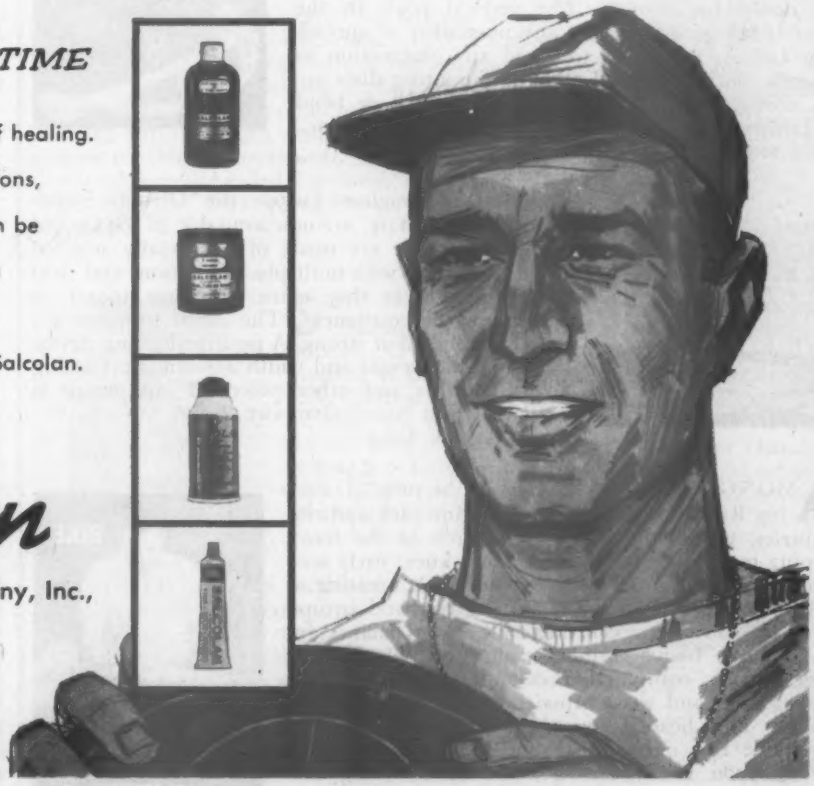

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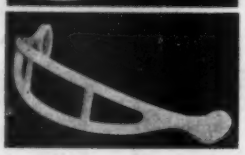

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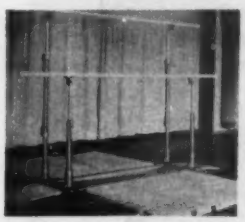

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and the kicker steps forward in the direction he intends to kick the ball. The end-over-end kick will generally result in more accurate yardage than the spiral kick. This is not the same procedure that is recommended to punters, because the rocker step punting technique is a little more complex.

The quick kicker must practice to learn just where the ball is to be contacted with his instep in order to get the proper effect, in this case, an end-over-end kick. He will find that little follow-through with the kicking leg will keep the ball at a lower level. If the receiving safety has anticipated the kick, then a roller away from him is in order. In any event, the kick places the ball where the kicker wants it to go for the greatest amount of good. The ball is not just booted and *wished* into a favorable position.

An important value inherent in the quick kick is that it affords a maximum amount of protection for the kicker, and a better opportunity for coverage. Usually, the line from tackle to tackle charges to bend over the opposition, and backfield protection is given the kicker both to his right and his left. If any type of wingback formation is employed, then coverage is afforded by three pursuers, the ends and a back.

With the trend towards stronger defenses, the punter will again become a major factor in any team's attack. The off-season is the time for him to prepare for his role.

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Its development as a quick energy food for athletes came about in a rather unusual manner. The Pfanstiehl Laboratories have produced pure fructose for many years for such uses as intravenous feeding of diabetics and children in hospitals. Hospitals use it because it is more rapidly absorbed and, as pointed out previously, metabolized differently from dextrose.

Two scientific reports were issued in Germany in 1954 and 1955. One of these dealt with the preferential value of fructose as compared with glucose (dextrose) in athletics. Some of the employees of the Pfanstiehl Laboratories, on reading the reports, decided to give fructose to their sons who were competing on the Waukegan, Lake Forest, and New Trier (Winnetka), Illinois athletic teams.

Teammates, coaches, and parents wanted to buy the tablets which are pure fructose with a trace of fresh lemon flavor. The tablets were packaged in polyethylene bottles and are available at $3.00 each. Each bottle contains 100 tablets. They are also available in quantities of 1000 packaged in fiber drums, and the cost is $25.00.

So far the response to these has been excellent. Herman Schillereff, the football and wrestling coach at Lake Forest High School, said: "We have been using "Frutabs" the past year for both practice and competition and during half-time. The difference in the performance of the boys was noted in less fatigue and better stamina. We also found that the use of "Frutabs" after competition relieved 'that tired feeling' which is particularly helpful preparatory to an evening of study. I find that on taking "Frutabs" after a strenuous session with the boys, I arrive home feeling rested and relaxed."

Del Jordan, the trainer, Charles Reid, basketball coach, and Ott Bay, wrestling coach at Waukegan High School, reported: "After switching to "Frutabs," our wrestlers and basketball teams showed more mental alertness and staying power, and we started winning. We have also had fewer injuries which we attribute to the boys not being so fatigued. We give four "Frutabs" about 30 minutes before a basketball game and two during halftime. The boys like the taste so well that we have to guard the supply rather than urge them to take their allotment."

"Frutabs" are being distributed through Pfanstiehl Laboratories, Waukegan, Illinois or Adolph Kiefer and Company, Railroad Avenue, Glenview, Illinois.

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THE "Thermophore" is designed to produce an intensely hot application of properly controlled moist heat. It does away with the old-style hot packs using wet towels. Available in a variety of sizes, the largest is 27" x 13". Either AC or DC current can be used, and the pad, two washable covers, thermostat, switch and 10-foot cord are included. Special weights located inside cause it to hug body contours. A descriptive brochure is available from Battle Creek Equipment Co., Dept. TA, Battle Creek, Mich.

A REAL boon for your program are these "Executive Scheduling Kits." Designed to save valuable wall space, the kits feature a weekly, monthly or yearly activities calendar and an all-purpose chart bound back-to-back. The "Eraso" surface wipes clean, enabling changes to be made instantly. Price is $11.50. Program Aids Co., Inc., 550 Fifth Ave., New York 36, N. Y.

"JUMP BALL" is a basketball-like sphere suspended overhead from a special response arm. When grabbed successfully, the player is able to pull the supporting arm and ball down. In addition to teaching rebounding, this device also strengthens forearms, wrists, and hands. Weight of the ball is adjustable at one-inch intervals. The calibrated scale makes it easy to determine each player's maximum jumping height and to record his progress. Halderman-Homme Mfg. Co., 2580 University Ave., St. Paul 14, Minn.

THIS one-piece plastic helmet was developed and field tested by the research department of Little League Baseball. The basic construction is a shock-resistant shell of "Cycolac" which has a high-impact strength. "Absorblo" padding is placed over the ears and the temples. A six-point nylon web suspension prevents direct contact with the head and affords greater freedom of movement. The "E200" also features reinforced beaded ear holes and edges. The MacGregor Co., 4861 Spring Grove Ave., Cincinnati 32, Ohio.

SCHOOLS that operate their own popcorn concessions will be interested in this new "Multipop Model 115" popper. After being loaded with 50 pounds of corn, 1½ gallons of oil, and 4 pounds of salt, the machine automatically pops all or any part of the corn according to the set of a dial. As soon as the corn is popped, it goes to another chamber where it is salted and stirred, and then released to a 7½ cubic foot heated storage well. Electroware Corp., 1336 W. Bancroft, Toledo 6, Ohio.

DESIGNED to hold a variety of athletic balls, this item is very convenient and, we might add, a much-needed piece of equipment in gymnasiums. The sturdy tubular steel trays provide "at-a-glance" accounting of the balls still in play. It glides effortlessly on ball bearing casters that cannot mar floors. Called the "Eight Ball Carrier" it sells for $21.95. Production Associates, 8323 S. E. Evergreen, Vancouver, Wash.

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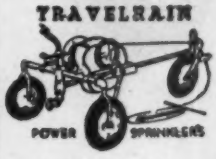

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Strikes and Spares

(Continued from page 34)

properly spaced, for spotting pins were painted at the end of each lane. Length of lanes, distances to foul lines, distances between alleys, and the foul lines were measured off and marked exactly the same as those found on standard alleys. Pits and backstops, using old tire casings, were built behind each lane. With the exception of a few dollars for paint, these alleys were constructed at no cost to the school. The students did all the necessary measuring and painting, and while doing it learned about size and measurements of alleys. Now we were really ready to roll, and the students could hardly wait to start knocking down pins.

During physical education classes, students are divided evenly between the five alleys. Two students are placed behind each pit. One rolls the ball back to the bowler, and the other clears the alley and sets the pins, after the bowler has delivered a ball. The balance of the bowlers line up at the head of their respective alleys and take turns bowling. As each student completes one frame of bowling, he rotates with one of the students in the pit. This procedure gives each student an opportunity to bowl, pins are always set up, alleys are always cleared of pins, and no one is overworked.

This type of bowling goes on for a few weeks, until, by explanation, demonstration, correction of mistakes, and a great deal of practice, each student becomes a fairly good bowler. Then the class is divided into teams, and the students compete against each other on a team basis. Posting of individual scores and team standings helped maintain a terrific interest in this class bowling. In fact, interest was so great that individuals and teams would come out on their own, after school, and practice.

On rainy or cold days, when it is impossible to go outdoors, we use the class periods to teach scorekeeping, meaning of bowling terms, safety precautions, etiquette, and sportsmanship of the game. Each student is expected to pass a written examination on all of the points listed previously, as part of his physical education class work. During these periods we also like to show films on bowling, and to bring in top men and women bowlers to talk and demonstrate some of the finer points of the game. We have never had any difficulty securing films or speakers for these sessions and it has never cost anything.

As a climax to our bowling program, we have six weeks of intramural bowling, boys' and girls' leagues, at a regular alley downtown. Alleys are reserved for our two leagues, and special rates are available for students who bowl in these leagues. There is no limit on the number of students who bowl on a team; in fact, the more bowlers who roll for a team during each match, the better the team's chances are of winning. A special handicap system has been worked out, whereby any bowler's score might be counted in the team score for that particular match. This has been done to encourage participation on the part of all students and to eliminate the possibility of a student feeling that he is not good enough to help his team.

After watching this program in operation here at Schlarman, we are convinced that bowling is a perfect and a necessary activity to include in a physical education program. The cost is negligible, and bowling alley owners, recognizing the fact that a program of this type is developing potential customers for their business, are only too happy to donate equipment. In our own case, the proprietor even donated trophies for intramural league champions. Bowling also gives each student an opportunity to learn and participate in a sport, with friends, mixed groups or with mother and dad, for the balance of his or her life.

As proof that the students do enjoy bowling, during the past ten years better than 80 per cent of our students participated in the intramural bowling program. If a school is looking for an excellent activity to pep up its physical education program, *get them rolling.*

TEN years ago Schlarman High School came into existence, and at that time Paul Shebby was appointed athletic director. He served as football, basketball, golf, and track coach at various times, has taken two basketball teams to the state tournament, and produced several outstanding football teams. Zeke Bratowski and Sleepy Klein of the Chicago Bears are two of his former players. Shebby has developed one of the finest physical education programs in the state.

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P. O. Box 5608, Chicago 80, Ill.

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Becton Dickinson & Co. 51
Rutherford, New Jersey

Bike Web Co. 45
309 W. Jackson Blvd., Chicago, Ill.

Brown Co., M. D. 65
Lake St., Niles, Mich.

Champion Knitwear Co. 35
115 College Ave., Rochester, N. Y.

Chrystal Co., Inc., Charles B. 52
53 Park Pl., New York 7, N. Y.

Converse Rubber Co. 47
Malden, Massachusetts

De Bourgh Mfg. Co. 59
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500 Fifth Ave., New York 36, N. Y.

Economy Track Equipment Co. 66
1824 Newark Ave., S.E., Grand Rapids 7, Mich.

Fenner-Hamilton Trampolin Co. 52
3200 S. Zuni St., Englewood, Colo.

Gared Corp. 4
918 Mullanphy St., St. Louis 8, Mo.

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489 Fifth Ave., New York 17, N. Y.

Gymnastic Supply Co. 60
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H. & R. Mfg. Co. 58
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Harter, House of 56
42 Harter Bldg., Goshen, Ind.

Harvard Table Tennis Co. 43
60 State St., Boston, Mass.

Hillerich & Bradsby Co. 24
434 Finzer St., Louisville, Ky.

Hillyard Chemical Co. 1
St. Joseph, Missouri

Hodgman Rubber Co. 53
Framingham, Massachusetts

Horn & Bro., Wm. H. 32
451 N. Third St., Philadelphia, Penna.

Huntington Laboratories, Inc. 17
Huntington, Indiana

Ivory System, Inc. ..... Cover 4
Peabody, Massachusetts

Jayfro Athletic Supply Co. 56
P. O. Box 1065 — Dept. C, New London, Conn.

Johnson & Johnson 25, 26, 27, 28
New Brunswick, New Jersey

K. & P. Athletic Co., The 60
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Linen Thread Co., Inc., 62, ☐ Information "Gold Medal" and "Invincible" nets
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TURF PRODUCTS

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Northern Indiana Basketball Coaching School, 58, ☐ Information

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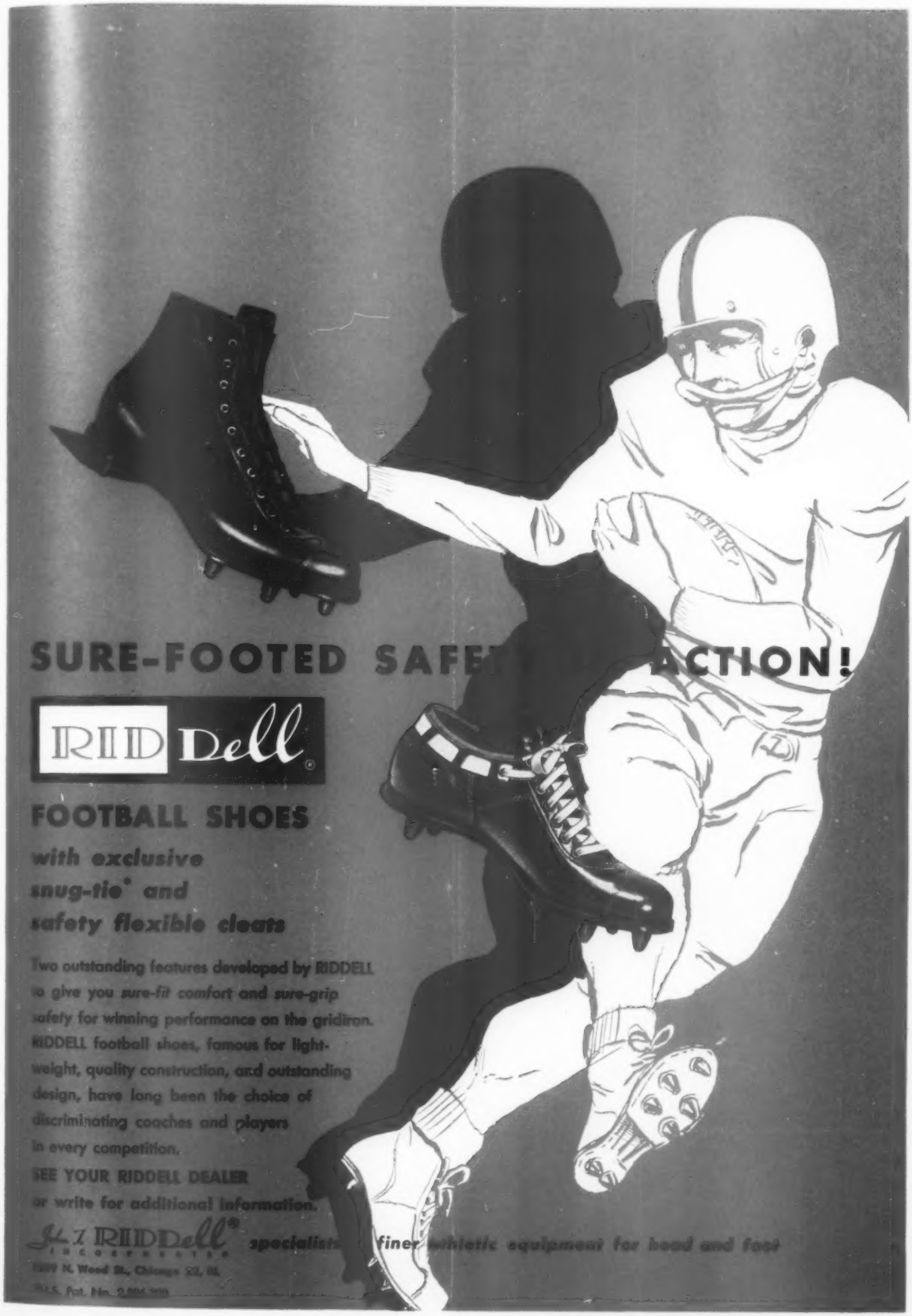
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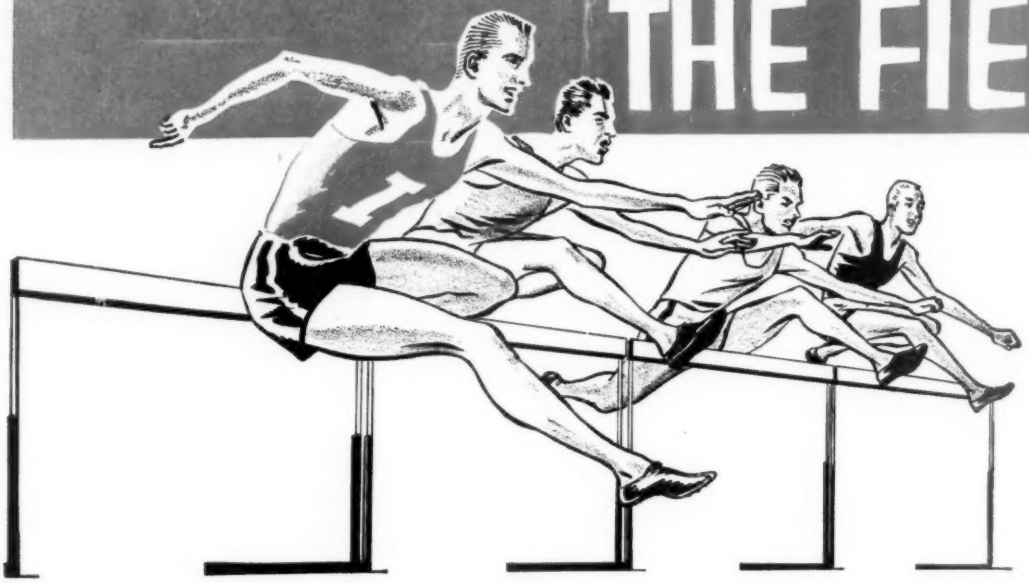

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